

**EFFECTIVENESS OF NEURAL MOBILISATION ALONG WITH
McKENZIE APPROACH (DIRECTIONAL PREFERENCE) FOR
CERVICAL DERANGEMENT SYNDROME**

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Bachelor of Science in Physiotherapy (B. Sc. PT)

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We the under signed certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

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CERVICAL DERANGEMENT SYNDROME**

Submitted by **Rafiul Karim**, for partial fulfilment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

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DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of information of the study, I would be bound to take written consent of my Supervisor and Head, Department of Physiotherapy, BHPI.

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Acronyms

BHPI	Bangladesh Health Professions Institute.
BMRC	Bangladesh Medical Research Council
CRP	Centre for the Rehabilitation of the Paralysed.
df	Degree of Freedom
DP	Directional Preference
NDI	Neck Disability Index
NPRS	Numeric Pain Rating Scale
PNF	Passive Neck Flexion
PNP	Peripheral Neuropathic Pain
ROM	Range of Motion
ULTT	Upper Limb Tension Test
WHO	World Health Organization

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Abstract

Purpose: The study was conducted to identify and investigate the therapeutic effectiveness of the neural mobilisation technique, given along with the McKenzie Approach (Directional Preference) for the treatment of Cervical Derangement Syndrome. This study has made the comparison, in order to discover the most effective treatment protocol to alleviate the symptoms of the condition. *Objectives:* To assess the effect on pain after introducing Neural Mobilization for Cervical Derangement Syndrome, to measure the severity of pain by using Numeric Pain Rating Scale (NPRS), to identify the distribution of pain, to measure the functional disability by using Neck Disability Index (NDI), to explore the socio-demography of the participants, to investigate the effect on reducing discomfort and functional disability after introducing Neural Mobilization. *Methodology:* The study was an experimental design. 14 samples were selected randomly from Out-patient treatment service of Musculoskeletal Unit, Physiotherapy Department, Centre for the Rehabilitation of the Paralysed (CRP), Savar. Initially all the subjects were assessed by McKenzie Cervical Spine Assessment Form at the clinical settings and then data were collected by questionnaires, Numeric Pain Rating Scale (NPRS) was used to assess pain intensity and Neck Disability Index (NDI) was used to measure the functional disabilities of the patients. Experimental Group received combination therapy of Neural Mobilisation techniques along with McKenzie Approach (Directional Preference) while Control Group received McKenzie Approach (Directional Preference) only. *Results:* The study has used statistical analysis by unrelated t test to compare the Experimental and Control Group and analysed by interpreting the probability level of significance of t value. The results were found to be significant for t value at probability level 0.05. *Conclusion:* The study concludes that the combination technique is significantly capable of producing beneficial effects on pain reduction, minimization of functional disability and cervical spinal mobility in patients with Cervical Derangement Syndrome.

Keywords: *Neural Mobilisation, McKenzie Approach, Directional Preference, Cervical Derangement Syndrome.*

1.1 Background

Cervical spine disorders are very common and often result in a disabling condition (Murphy, 2004). Patients who are suffering from the symptoms of this condition frequently attend for physiotherapy (Boyles, 2011). According to Schenk (2008), 25% are referred for treatment for cervical pain of the total patients seen in outpatient physical therapy.

Among people, Neck pain and disability are major problems and the prevalence of neck pain in general population in one year ranging from 4.8% to 79.5%, On the other hand, Neck pain that restricts daily functional activities is not also rare (17% to 70%) (Takasaki & May, 2014). Cervical radiculopathy has a reported annual incidence of 83.2 per 100000 and an increased prevalence in the fifth decade of life among the general population (Radhakrishnan et al., 1994). Among them the prevalence rate of Cervical Derangement Syndrome varies quite widely across different surveys, and McKenzie (1990) states that “most patients develop pain and seek assistance as the result of derangement”. The pain caused by Cervical Derangement Syndrome occurs as a result of anatomical disruption and the flow or displacement within the intervertebral disc.

Cervical Derangement is a disorder which commonly manifests clinical features of pain radiating from the neck into the distribution of the affected nerve root. Patients usually complain of pain, numbness, tingling sensation, and weakness in the upper extremity, which often results in significant functional limitations and disability (May & Aina, 2012).

The symptoms of cervical derangement syndrome may be felt locally or centrally to the Spinal column, and may radiate and be referred distally in the form of pain, paraesthesia or numbness (McKenzie, 1990).

Depending on the affected nerve root level, the site and pattern of symptoms may vary and can include alteration of sensory and/or motor functions if the dorsal and/or ventral nerve root is involved (Rao, 2002).

Disc derangement in the cervical spine may be diagnosed by utilizing the McKenzie protocols of end range loading, looking for a pattern of peripheralization and centralization of pain (Heffner, 2000).

The McKenzie mobilization technique works on the principle of centralization in subjects with cervical syndromes. Centralization refers to the phenomenon by which distal limb pain and symptoms originating from the spine is abolished in response to the slow, careful and measured application of loading strategies. This phenomenon is characteristic of derangement syndrome (May & Aina, 2012).

McKenzie & May (2003) defined directional preference as repeated movements in the direction that decreases, centralizes or abolishes symptoms, and/or produces a positive mechanical response. On the other hand, Neural mobilization of the nervous system, described by Maitland in 1985, Elvey in 1986 and refined by Butler in 1991, is an addition to the assessment and treatment of neural pain syndromes, including cervical spinal syndromes.

Neural mobilization is a gentle movement technique used by the physiotherapists to move the nerves. It contributes to restoring the stretching and tensile ability of neural tissue and stimulates the restoration of normal physiological function of nerve cells (Nee & Butler, 2006).

It should be mentioned that, Cervical Derangement Syndrome causes peripheral neuropathic pain (PNP) that arises as a result of a lesion or disease affecting the somato-sensory component of the peripheral nervous system (Treede, 2008).

Nee & Butler (2006) proposed that neurodynamic mobilization techniques can be effective in addressing peripheral neuropathic pain where nerve roots may have been injured.

A derangement of the intervertebral disc may lead to cervical radiculopathy and the neural mobilization is reported to be an effective intervention for cervical radiating pain due to derangement (Murphy et al., 2006).

Considering the facts of cervical syndrome it is evident that the treatment methods should target the reduction of pain which is due to neural compression.

Cervical spine mobilization according to the McKenzie approach, and neural mobilization, plays important roles in decreasing pain and improving the range of motion of the cervical spine in patients with derangement syndrome (Murphy & Hurwitz, 2007).

Cervical mobilization permits early treatment by gentle oscillatory movements, which have the effects of decreasing muscle spasm and pain and thus gradually improving mobility (Murtagh & Kenna, 1997).

Neural tests are mechanically used to stimulate and move neural tissues, in order to gain insight into their mobility and sensitivity to movement. In the presence of an abnormality, skilled manual therapy treatment using these tests is designed to improve the mobility of the neural structures and consequently to reduce sensitivity to movement and tension. Examples of these include Straight Leg Raising (SLR), Passive neck flexion (PNF), Slump test and Upper limb tension test (ULTT) (Shacklock, 1995).

As very few studies have been done to compare the efficacy for patients, of cervical spine mobilization according to the McKenzie approach on one hand, and patients receiving both the McKenzie approach, together with neural mobilization for cervical derangement syndrome. The design of this study will make the comparison, in order to discover which treatment is the most effective to alleviate the symptoms of the condition.

1.2 Rationale

Physiotherapy approaches and techniques play an important role in the treatment and improvement of symptoms in patients with Cervical Derangement.

But there is a lack of evidence in the treatment technique using Neural Mobilization along with McKenzie Approach.

So this study is designed to investigate the efficacy of Neural Mobilization along with the McKenzie Approach (Directional Preference) for Cervical Derangement Syndrome.

In Bangladesh there is no published research on Cervical Derangement Syndrome and therefore no research directly comparing the two different treatment procedures mentioned above.

1.3 Aim

The aim of the study is to assess the therapeutic effectiveness of neural mobilisation along with the McKenzie Approach (Directional Preference) for the treatment of Cervical Derangement Syndrome.

1.4 Objectives

General objective

- To identify and analyse the therapeutic effectiveness of the neural mobilisation treatment, given along with the McKenzie Approach (Directional Preference) for the treatment of Cervical Derangement Syndrome.

Specific objective

1. To assess the effect on pain after introducing Neural Mobilization and McKenzie Approach (Directional Preference) for Cervical Derangement Syndrome.
2. To investigate the effect on reducing discomfort and functional disability after introducing Neural Mobilization.
3. To formulate recommendations for the health professions about treatment guidelines for Cervical Derangement patients evaluating the result of the study.

1.5 Hypothesis and Null-Hypothesis

Hypothesis

Neural mobilization along with the McKenzie Approach (Directional Preference) is more effective than only the McKenzie Approach (Directional Preference) for the treatment of Cervical Derangement Syndrome. ($H_A > H_0$).

Null-Hypothesis

Neural mobilization along with the McKenzie Approach (Directional Preference) is not more effective than the McKenzie Approach (Directional Preference) alone for the treatment of Cervical Derangement Syndrome. ($H_0 \neq H_A$).

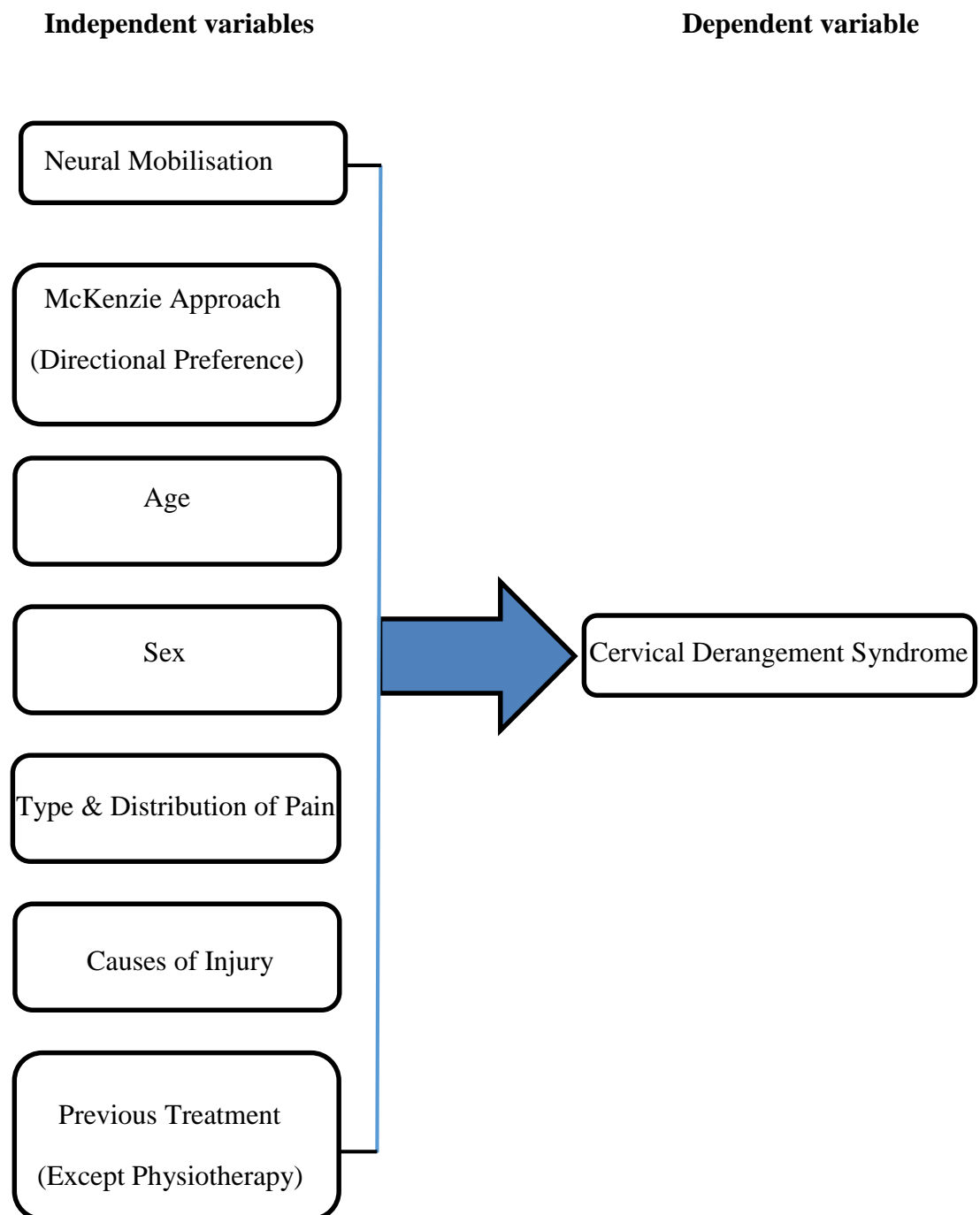
$$H_0: \mu_1 = \mu_2$$

Where,

H_0 = the null hypothesis,
 μ_1 = the mean of population 1, and
 μ_2 = the mean of population 2

$H_0: \mu_1 - \mu_2 = 0$, against
 $H_0: \mu_1 - \mu_2 \neq 0$

1.6 Conceptual Framework



1.7 Operational Definition

Cervical Derangement Syndrome: Disc derangement occurs due to anatomical disruption when the nucleus pulposus becomes displaced from its central position in the disc to the periphery, within the motion segment of cervical spine characterised by symptoms felt locally or centrally to the spinal column, and may radiate and be referred distally in the form of pain, paraesthesia or numbness.

McKenzie approach: A method that is hypothesized to work on the phenomenon of centralization of peripheral symptoms by positioning, mobilization and manipulation.

Directional Preference: Directional preference is defined as repeated movements in the direction that decreases, centralizes or abolishes symptoms, and/or produces a positive mechanical response. These include extension, flexion, lateral or combination. Although this may change during the course of treatment.

Neural Mobilisation: Neural Mobilization is an oscillatory stretching of nerve roots that works on stimulating mechanical receptors, micro lengthening, and improving neural circulation at root level to reduce the oedema and hence reduce cervical syndrome or radicular symptoms.

Patients with Cervical pain and radiation most frequently complain of neck pain, paraesthesia and radicular pain, also sensory symptoms typically present along a dermatome, often myotome, upper limb weakness (15%), decreased sensation (33%) and often muscle atrophy (2%). Physical examination usually reveals painful cervical spine range of motion (ROM) and decreased deep tendon reflexes. The intervertebral disc has been found to be causative in only 22% of cases, while 68% of cases appear to arise from a combination of discogenic and spondylotic causes (Radhakrishnan et al., 1994).

Cowell & Philips (2002) in a single case study experimental design suggested that mechano-receptor sensitivity of the upper limb peripheral nerve trunks may contribute to the pathology of Cervicobrachial pain syndrome.

May & Aina (2012) in a systematic review, found three studies where patients with a directional preference responded significantly better to treatment when compared to other treatments. They found evidence of the use of directional preference as a treatment effect modifier.

Pain from derangement is theorized to arise from the intervertebral disk. End-range loading manoeuvres were applied if examination identified one or more specific directions of movement that produced centralization of a patient's pain (Aina et al., 2004).

The treatment protocol based on determining a direction of preference for cervical derangement syndrome and disabilities associated with this condition has been shown to positively in effect (Clare et al., 2005). This involves postural correction and the performance of those repeated movements that improve symptoms. Patient's direction of preference can be referred as the direction of movement and exercises that produce a favourable response to the patient (Long et al., 2004).

Cleland et al. (2007) found in his study that, 23 patients received neural dynamic techniques or neural mobilizations, of which 13 patients (56.5%) had a successful outcome.

According to published article of Takasaki & May (2014, p.79) “Derangement Syndrome has a Directional Preference (DP), which is a direction of movement where pain is reduced or Range Of Motion is increased with or without centralisation”.

Techniques that are reported to mobilize components of nervous system may be used to diminish the patient’s symptoms (Butler, 1991).

Certain clinical provocation tests and techniques e.g. ULTT have been employed as a means of identifying neural tissue involvement in cervical pain syndrome (Selvaratnam et al., 1994; Cowell & Philips, 2002).

In the sub-acute and chronic patients, neural mobilization is often helpful. This involves gentle repetitive movements of the nerve root/ peripheral nerve complex into the direction of restriction and pain. There are various manoeuvres that can be used, including the lateral glide mobilization, which may allow one to target the nerve root, and distal brachial plexus mobilization, which theoretically affects the brachial plexus more globally (Murphy, 2004).

Ellis & Hing (2008) concluded that neural mobilization can be used for treatment of neurodynamic dysfunction and has positive therapeutic benefit.

The study of single-blind randomized controlled trial of thirty subjects (male 10, Female 20) by Allison et al. (2002) clearly demonstrated significant improvements in pain and disability in both experimental and control group. The Neural Mobilisation group had significantly lower pain levels by compared to the articular mobilisation treatment group.

Abdulwahab & Sabbahi (2000) found in their study that continuous neck flexion will increase the symptoms and repeated retraction will decrease the pain. However, in another research Abdulwahab (1999) found neural mobilization that reduces pressure on nerve roots by widening the intervertebral foramina and realign the spine in its optimal position may relieve symptoms.

In a comparison between nerve mobilization and cervical traction with cervical radiculopathy patients, researchers found there was significant improvement in both groups but more clinically meaningful changes were seen in the nerve mobilization group (Sambyal & Kumar, 2013, p.444).

On the other hand, Kumar (2010, p.74) concluded his study stating that Neural mobilisation shows poor improvement may be because of provocation to the nerve roots compared with Conventional Physiotherapy and McKenzie manipulation. But, Patients treated with McKenzie manipulation were resulted in maximum relief of the symptoms and pain reduction.

Nee & Butler (2006) proved that the neurodynamic technique can be effective in addressing musculoskeletal presentation of neuropathic pain. The study included that the peripheral neuropathic pain is because of injury to root or peripheral nerve trunk by mechanical or chemical stimuli. Clinical manifestation includes positive and negative symptoms. Positive symptoms reflect an abnormal level of exhibitions in the nervous system and include pain, paraesthesia, and dysesthesia. Negative symptoms indicate reduced impulse conduction in the neural tissue and hypoesthesia or anaesthesia and weakness.

Coppieters (2003) suggested that cervical lateral glide treatment technique has a positive immediate effect in patients with sub-acute peripheral neurogenic cervico brachial pain

Hunt (2002) found that neural mobilization is a therapeutic technique that has received favourable acceptance as management approach to neurogenic pain syndrome. Anatomical and bio- mechanical review of peripheral nerves includes nerve mobility and stress and strain characteristics in both upper and lower extremities and mechanisms and consequences of trauma on nerve microcirculation as well as influence on axoplasmic and lymphatic flow with in peripheral nerve

According to Keleinrensink et al. (2000), the aim of the study was to find out the validity of the tension test used in the diagnosis of the root and plexus lesions of the upper extremity. The Upper limb tension test combined with contra lateral rotation and lateral bend of cervical spine were used to generate tension. The Median nerve Upper limb tension test turned out to be sensitive and specific tension test. The findings justify exclusively the Median nerve Upper limb tension test on its validity

According to Shacklock (1995), mobilization of the nervous system is an approach to physical treatment of pain. The method influences pain physiology via mechanical treatment of neural tissues and the non-neural structures surrounding the nervous

system. The musculoskeletal system exerts non uniform stresses and movement in neural tissue depending on the local anatomical and mechanical characteristics and pattern of body movement. This response includes neural sliding, pressurization, Elongation and changes in intra-neural microcirculation, axonal transport and impulse traffic. Many events occur in body including tension; neural tension can better be explained by including mechanical and physiological mechanism. Neural tension test may be better described as Neurodynamic test.

Neck Disability Index (NDI) is highly reliable, strongly internally consistent, and with a 1-factor structure for “physical disability.” It has strong and well-documented convergent and divergent validity with other instruments used in the evaluation of patients and subjects with neck pain. Clinicians can confidently apply a “minimum clinically important change” value of 3 to 5 points in their practice settings. NDI is a relatively short, paper-pencil instrument that is easy to apply in both clinical and research settings. It has strong psychometric characteristics and has proven to be highly responsive in clinical trials (Vernon, 2008).

This study was an experimental design to evaluate the effectiveness of physiotherapy techniques combining Neural Mobilisation along with the McKenzie Approach (Directional Preference) and also to compare their effectiveness with the McKenzie Approach (Directional Preference) alone for the management of pain and improvement of different functional activities of the patients with Cervical Derangement Syndrome. To identify the effectiveness of this treatment regime, Numeric Pain Rating Scale (NPRS) and Neck Disability Index (NDI) were used as measurement tools for measuring the pain intensity and to assess how the pain affect different functional abilities to manage in everyday life.

3.1 Study Design

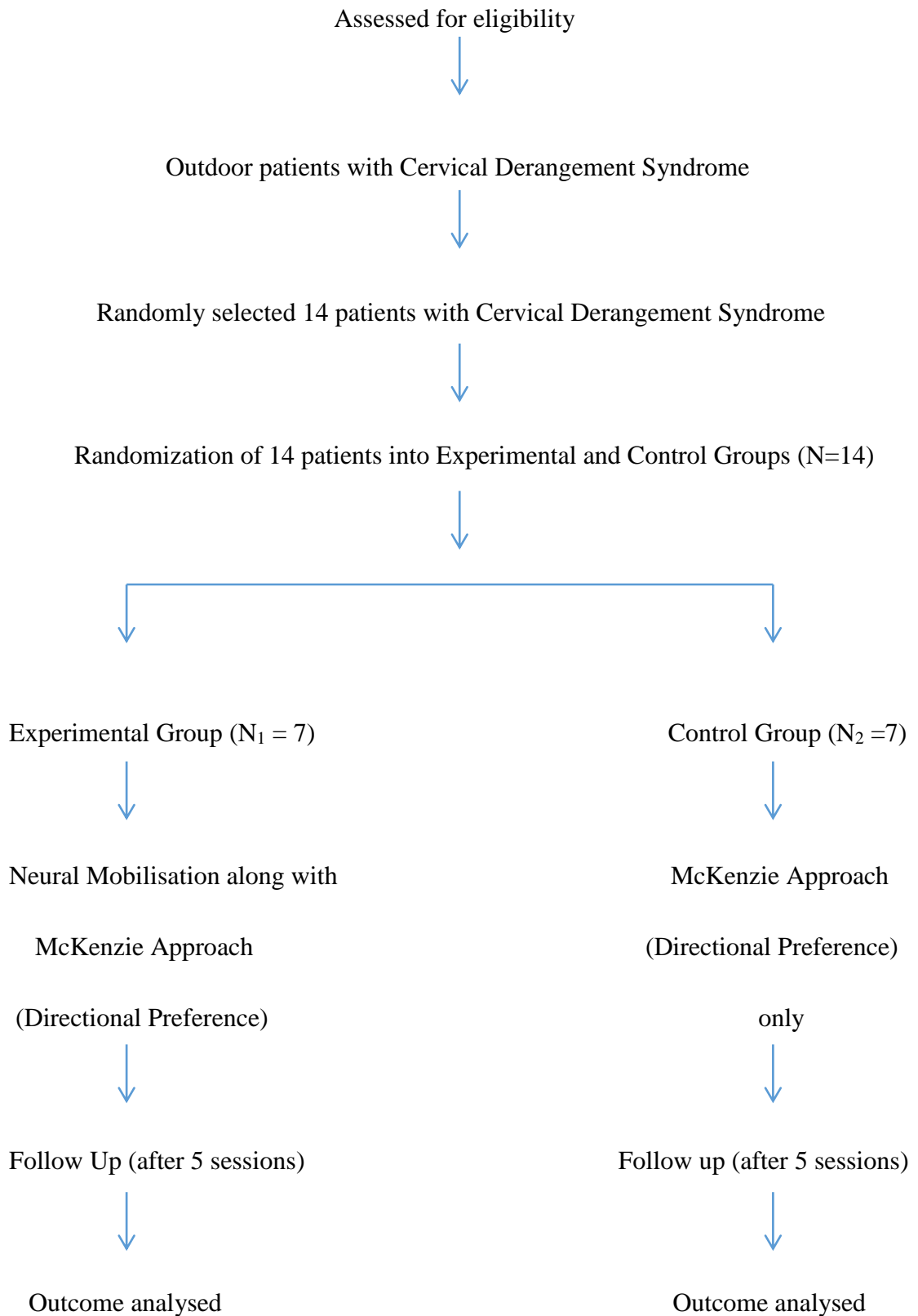
The study was designed using an experimental design quantitative research. According to DePoy & Gitlin (2013) the design could be shown by:

Experimental Group	:	R	O ₁	X	O ₂
Control Group	:	R	O ₁		O ₂

The study is an experimental between two subject designs. Neural Mobilization and McKenzie Approach will be applied to the experimental group and only McKenzie Approach will be applied to the control group.

A pre-test (before intervention) and post-test (after intervention) will be administered with each subject of both groups to compare the pain effects before and after the treatment.

Flow-chart of the phases of Randomized Controlled Trial



3.2 Treatment Regime

Control Group

Control Group was given McKenzie Approach (Directional Preference) Only according to patient's response to treatment.

McKenzie Approach (Directional Preference)

Before starting McKenzie Approach all the patients were assessed properly by McKenzie test movements for cervical spine in the study clinical settings. From test movements a particular posture and direction was selected. The directional preference was carefully chosen from the responses of the test movements.

- Retraction (With overpressure, sitting or lying)
- Retraction and extension (With overpressure, sitting or lying)
- Maintenance of retracted head posture, Extension (In sitting or lying prone)
- Extension with traction and rotation in lying
- Extension in lying prone
- Extension mobilisation
- Lateral flexion (with overpressure in sitting)
- Lateral flexion mobilization in sitting or lying
- Rotation (with overpressure in sitting)
- Rotation mobilization in sitting or lying
- Flexion in sitting followed by extension in sitting or lying
- Flexion mobilisation (if necessary) (McKenzie, 1990).

Experimental Group

Experimental Group was given both McKenzie Approach (Directional Preference) and Neural Mobilisation. McKenzie Approach (Directional Preference) was common treatment regimen for both groups. But Neural Mobilisation was given along with McKenzie Approach (Directional Preference) given by single qualified physiotherapist who is expertized in neural mobilization technique.

Neural Mobilisation

	ULTT2a	ULTT2b	ULTT3
Nerve Bias	Median nerve	Radial nerve	Ulnar nerve (C8, T1)
Shoulder	Depression and abduction -10 degrees	Depression and abduction -10 degrees	Depression and abduction(10-90 degrees hand to ear)
Elbow	Extension	Extension	Flexion
Forearm	Supination	Pronation	Supination
Wrist	Extension	Flexion and Ulnar deviation	Extension and Radial deviation
Fingers and thumb	Extension	Flexion	Extension
Shoulder joint	Lateral rotation	Medial rotation	Lateral rotation
Cervical spine	Contralateral side flexion	Contralateral side flexion	Contralateral side flexion

Table – 1: Neural Mobilisation Protocol

Procedure

The subjects were treated with neural mobilisation for cervical derangement syndrome for 5 days. For this, participants were given a comfortable supine lying position. ULTT method was implemented to the ipsilateral upper limb given in the table.

Experimental group was treated with neural mobilisation of 20 seconds oscillations of three sets during each session.

In this technique gentle and firm movements, through and end range was applied.

Active or passive mobilizations were applied according to the patient's symptoms.

Grades 1 to grade 4 oscillations were applied from the distal component.

Duration of oscillation was 60 seconds, which was divided in to three, equal burst.

After mobilization, patients were advised for self-mobilization techniques.

3.3 Study Area

Musculo-skeletal Unit of Physiotherapy Department at CRP, Savar, Dhaka.

3.4 Study Population

The study population was the patients diagnosed as Cervical Derangement Syndrome attended in the Musculo-skeletal Unit of Physiotherapy Department at CRP, Savar, Dhaka.

3.5 Sample Size

Sample size was 14 participants. 7 participants was in experimental group and 7 participants in control group.

Sampling Technique

Simple Random sampling technique was used in this study.

Subjects, who met the inclusion criteria, were taken as sample in this study. 14 patients with Cervical Derangement Syndrome were selected from outdoor musculoskeletal unit of physiotherapy department of CRP, Savar and then 7 patients were randomly assigned to Experimental group comprising of treatment approaches of Neural Mobilisation along with the McKenzie Approach (Directional Preference) and 7 patients to the only the McKenzie Approach (Directional Preference) for this study. The study was a single blinded technique. When the samples were collected, the researcher randomly assigned the participants into experimental and control group, because it improves internal validity of experimental research. The samples were given numerical number C1, C2, C3 etc. for the control group and E1, E2, E3 etc. for experimental group. Total 14 samples were included in this study, among them 7 patients were selected for the experimental group [received Neural Mobilisation along with the McKenzie Approach (Directional Preference)] and rest 7 patients were selected for control group (receive only the McKenzie Approach (Directional Preference)]

3.6 Inclusion criteria

- Mechanical cause of cervical pain and its radiation to the arm, forearm, and hand.
- Age group: 18-60 year. McKenzie (1990) stated this age group for describing Cervical Derangement Syndrome. Even he also stated that, Cervical Syndrome may occur because of different causes even from age of 12 years.
- Both sex
- Patients who experiences recurrent episodes of pain at neck or reference to upper or mid scapula or limb proximally or intermittent symptoms. McKenzie (1990) included the symptom for describing cervical syndrome or neck pain.
- Not any history of previous physiotherapy

3.7 Exclusion Criteria

- Patients with clinical disorder where Neural Mobilization is contraindicated
- Diagnosis of secondary complications such as tumour, TB spine, fracture, dislocation and severe osteoporosis, Paget's disease.
- All sorts of infection, Rheumatoid Arthritis, Ankylosing Spondylitis
- Cauda-equina lesions, Cord signs & Syndrome, Transverse myelitis.
- Surgery to the neck spine.
- Vertebro-basillary artery insufficiency, Vascular abnormality

3.8 Data Processing

3.8.1 Data Collection Tools

- Record or Data collection form
- Consent Form
- Structured questionnaire. (Both open ended and close ended questionnaire)
- Numeric Pain Rating Scale – for measuring pain.
- Neck Disability Index (NDI)
- Pen, Papers

3.8.2 Measurement Tools

Numeric Pain Rating Scale (NPRS): McCaffery et al. (1999) used a numeric scale to rate the pain status experienced by patients. It is known as Numeric Pain Rating Scale. The scale is a 10 cm long scale ranging from 0-10. Here a zero (0) means no pain, 1-3 indicates mild pain, 3-5 indicates that pain is in moderate state and 6-10 is worst possible pain feeling experienced by patients. Cleland et al. (2008) examined the test-retest reliability of the NPRS for a subgroup of patients with mechanical neck pain. The results of this study suggest that the NPRS exhibited moderate test-retest reliability, which is similar to the test-retest reliability identified in a patient population with cervical radiculopathy or mechanical causes of neck pain. Most recently the results of the study of Young et al. (2010) exhibited fair test-retest reliability in patients with Cervical Radiculopathy.

Neck Disability Index (NDI): This is a set of questionnaire that has been designed to provide information regarding how the patient's neck pain affects his/her ability to manage in everyday life. Neck Disability Index (NDI) is developed by Vernon & Mior (1991). NDI contains 10 different sections of questions, each of which has 6 grades of defined statements. For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked the section score = 5. Cleland et al. (2008) examined the test-retest reliability of the NDI for a subgroup of patients with mechanical neck pain. The results of this study suggest that the NDI

exhibits only fair test-retest reliability. Similarly the results of the study by Young et al. (2010) suggest that the NDI exhibits only fair test-retest reliability, which is lower than the values reported by Cleland et al. (2008) in patients with mechanical neck pain or cervical radiculopathy.

3.8.3 Data Collection Procedure

The study procedure was conducted through assessing the patient, initial recording, treatment and final recording. After screening the patient at department, the patients were assessed by a graduate qualified physiotherapist. 5 sessions of treatment was provided for every subject. 14 subjects were chosen for data collection according to the inclusion criteria. All participants were divided into two groups and coded C1, C2, C3, C4, C5, C6, C7 for control group and E1, E2, E3, E4, E5, E6, E7 for experimental group.

Data was gathered through a pre-test, intervention and post-test and the data was collected by using a written questionnaire form. Pre-test was performed before beginning the treatment and the intensity of pain was noted with NPRS score and NDI questionnaire form. The same procedure was performed to take post-test at the end of 5 sessions of treatment. The assessment form was provided to each subject before starting treatment and after 5 sessions of treatment patient was instructed to put mark on the line of NPRS according to their intensity of pain. The data were collected from both in experimental and control group in front of a graduate qualified physiotherapist and verified by a witness selected by the Head of clinical setting in order to reduce the biasness. At the end of the study, for statistical analysis different tests were carried out to perform statistical analysis.

3.9 Data Analysis

Statistical analysis was performed by using Microsoft Excel 2013 and Scientific Calculator.

3.9.1 Statistical Test

The data was analysed by unrelated t test as the study was a before-and-after observations on the same subjects and there was a comparison of two different methods of measurement or two different treatments where the measurements/treatments are applied to the same subjects.

According to Hicks (2009), experimental studies with the different subject design where two groups are used and each tested in two different conditions and the data is interval or ratio should be analysed with unrelated t test. This test is used when the experimental design compares two separate or different unmatched groups of subjects participating in different conditions. When calculating the unrelated t test, you find the value called ' t ' which you then look up in the probability tables associated with the t test to find out whether the t value represents a significant difference between the results from your two groups.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\left(\sum X_1^2 - \frac{(\sum X_1)^2}{n_1}\right) + \left(\sum X_2^2 - \frac{(\sum X_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Where,

\bar{x}_1 = Mean of scores from control group.

\bar{x}_2 = Mean of scores from experimental group.

$\sum X_1$ = The total of the individual score from control group.

$\sum X_2$ = The total of the individual score from experimental group.

$\sum X_1^2$ = The summation of square of the each individual score from control group.

$\sum X_2^2$ = The summation of square of the each individual score from experimental group.

n_1 = Number of subjects in control group.

n_2 = Number of subjects in experimental group.

3.9.2 Level of Significance

In order to find out the significance of the study, the “p” value was calculated. The p values refer to the probability of the results for experimental study. The word probability refers to the accuracy of the findings. A p value is called level of significance for an experiment and a p value of <0.05 was accepted as significant result for health service research. If the p value is equal or smaller than the significant level, the results are said to be significant.

3.10 Ethical Issues

The whole process of this research project was done by following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines. The proposal of the dissertation including methodology was approved by Institutional Review Board and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI). Again before the beginning of the data collection, the researcher obtained the permission ensuring the safety of the participants from the concerned authorities of the clinical setting and was allotted with a witness from the authority for the verification of the collected data. The researcher strictly maintained the confidentiality regarding participant's condition and treatments.

3.11 Informed Consent

The researcher obtained informed consent to participate from every subject. A signed informed consent form was received from each participants. The participants were informed that they have the right to meet with outdoor doctor if they think that the treatment is not enough to control the condition or if the condition become worsen. The participants were also informed that they are completely free to decline answering any question during the study and are free to withdraw their consent and terminate participation at any time. Withdrawal of participation from the study should not affect their treatment in the physiotherapy department and they should still get the same facilities. Every subject had the opportunity to discuss their problem with the senior authority or administration of CRP and have any questioned answer to their satisfaction.

Mean Age of the Participants

Experimental Group		Control Group	
Subjects	Age (Years)	Subjects	Age (Years)
E1	50	C1	35
E2	26	C2	60
E3	34	C3	44
E4	32	C4	30
E5	34	C5	60
E6	50	C6	22
E7	50	C7	49
Mean Age	39 years	Mean Age	42 years

Table - 2: Mean Age of the Participants

Age Range

The majority of the participants 36% (n=5) were in “41-50” years of age followed by 29% (n=4) were in “31-40” years, 21% (n=3) were in “21-30” years and 14% (n=2) were in “51-60” years of age range group.

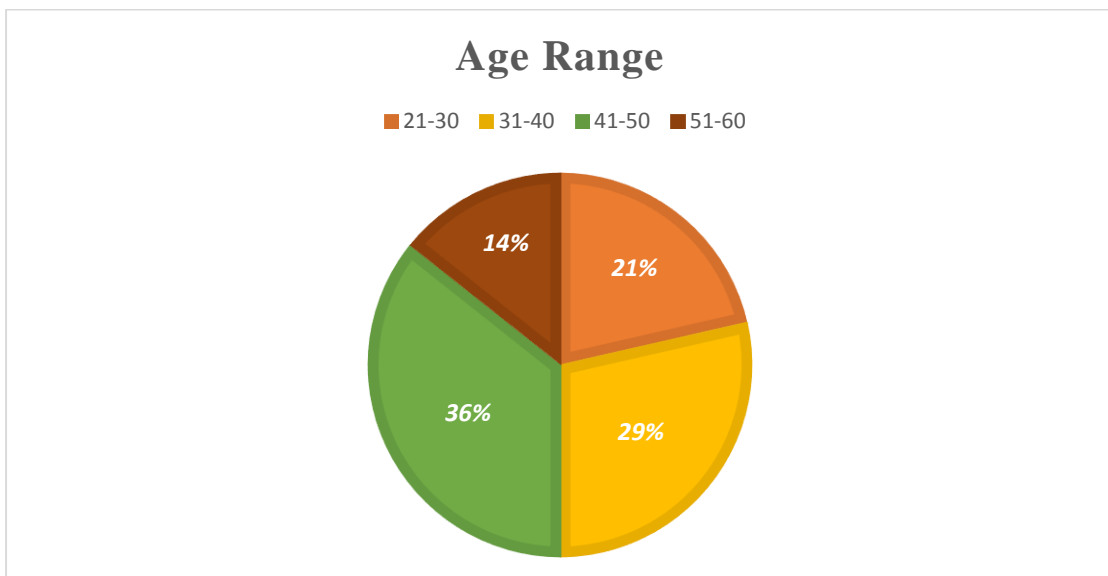


Figure – 1: Age Range of the Participants with percentage

Sex of the Participants

14 Patients with Cervical Derangement Syndrome were included as sample of the study, among them 50% (n=7) were Male and 50% (n=7) were Female. On the other hand, In Experimental Group 29% (n=4) were Male and 21% (n=3) were Female and in Control Group 21% (n=3) were Male and 29% (n=4) were Female

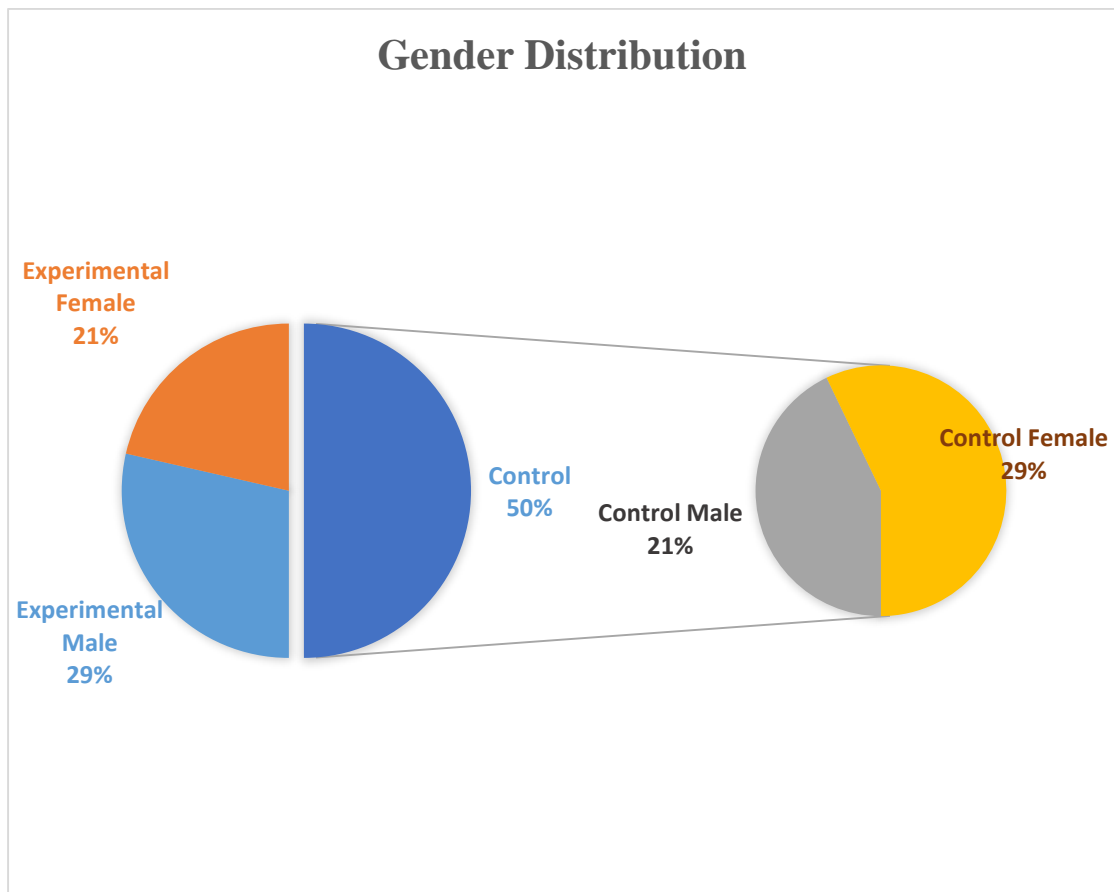


Figure – 2: Gender Distribution with percentage

Types and Distribution of Pain

All the 14 patients of this study were suffering from neck pain and 50% (n=7) were of chronic neck pain, 7% (n=1) were of acute neck pain and 43% (n=6) were of sub-acute low back pain.

Among them 13 patients had radiating pain up to arm and 36% (n=5) of them had chronic arm pain, 14% (n=2) had acute arm pain, 43% (n=6) had sub-acute arm pain and 1 patient had no arm pain e.g. 7%.

Among them 7 patients had radiating pain up to forearm and 22% (n=3) of them had chronic forearm pain, 14% (n=2) had sub-acute forearm pain, 14% (n=2) had acute forearm pain and 7 patients had no forearm pain e.g. 50%.

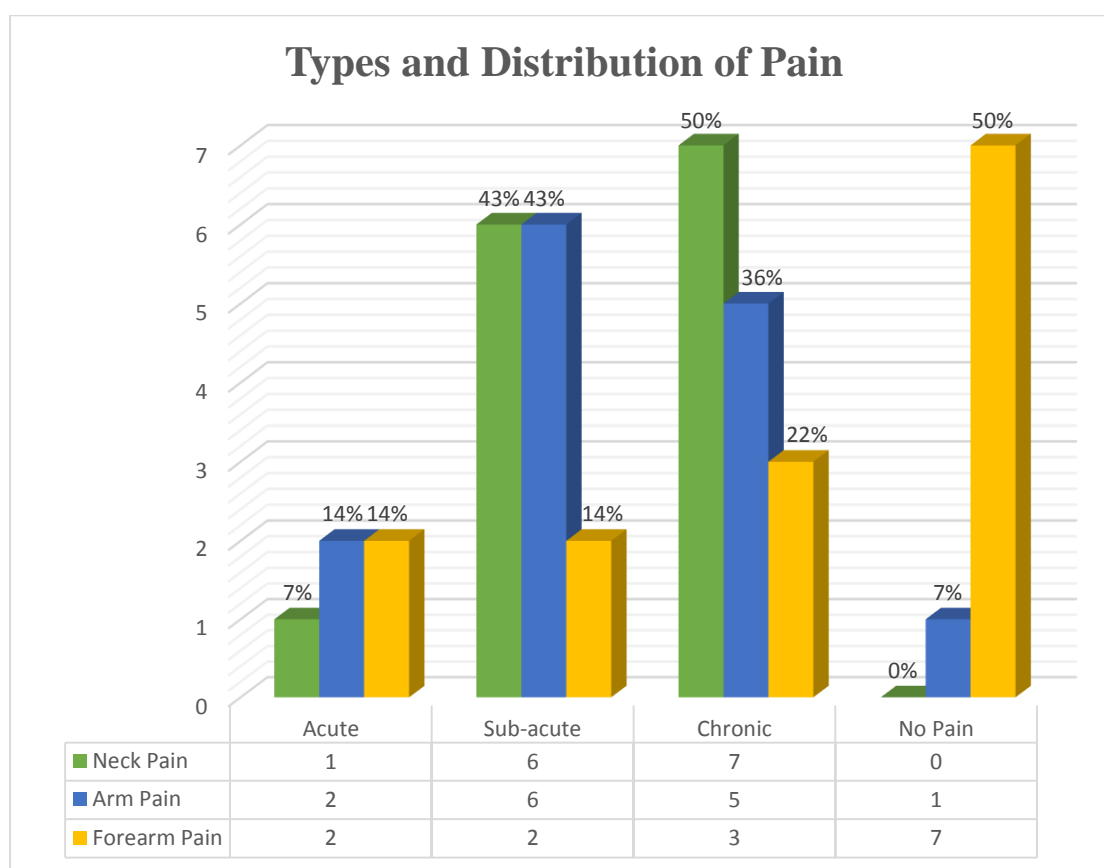


Figure – 3: Types and Distribution of Pain

Reported Weakness in the Upper Limb

The pie chart shows that among the participants it was found that, half of them that is 50% (n=7) reported of getting less strength in upper limb on the other hand, 50% (n=7) were reported not in Cervical Derangement Syndrome.

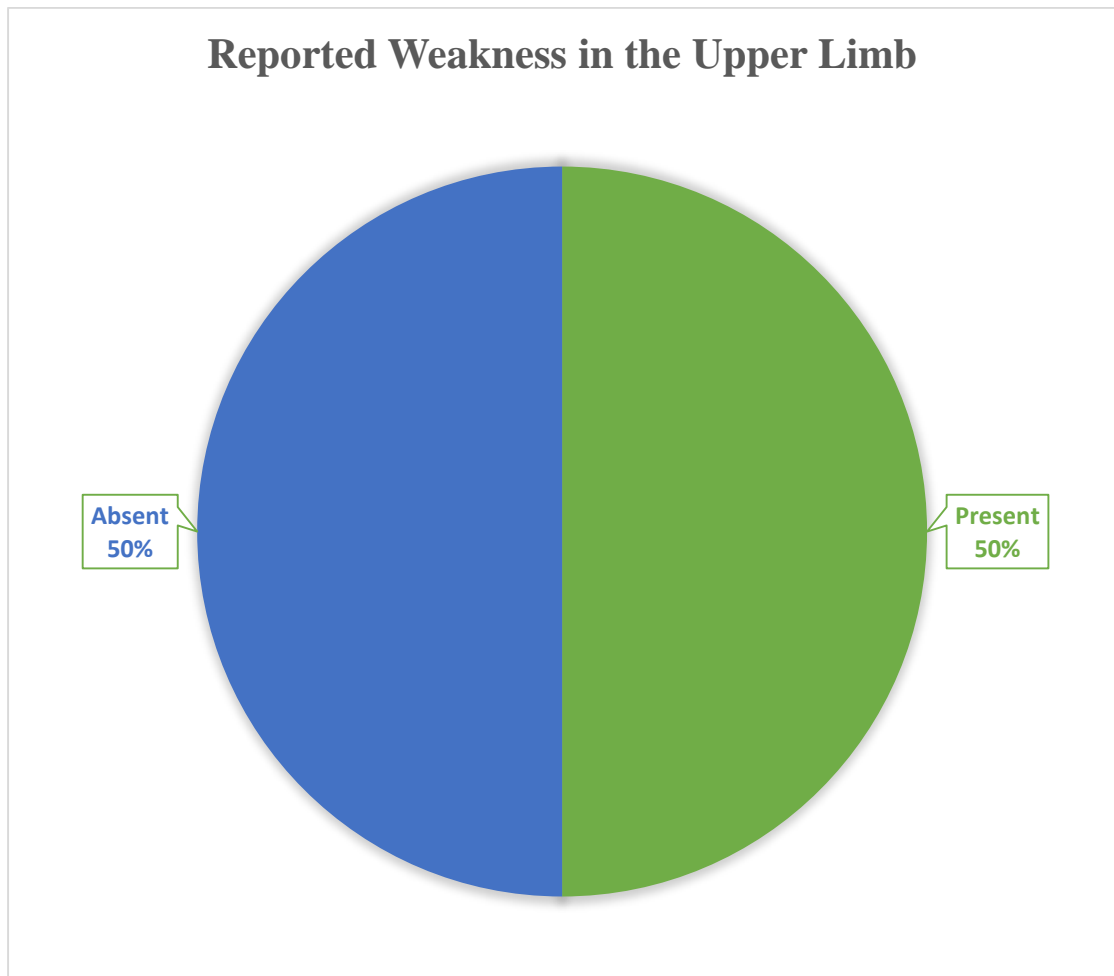


Figure - 4: Reported Weakness in the Upper Limb

Reported Paraesthesia or Numbness in Upper Limb

The pie chart shows that among the participants it was found that 29% (n=4) were reported no paraesthesia or numbness meanwhile 71% (n=10) were reported of feeling paraesthesia or numbness in the upper limb in Cervical Derangement Syndrome.

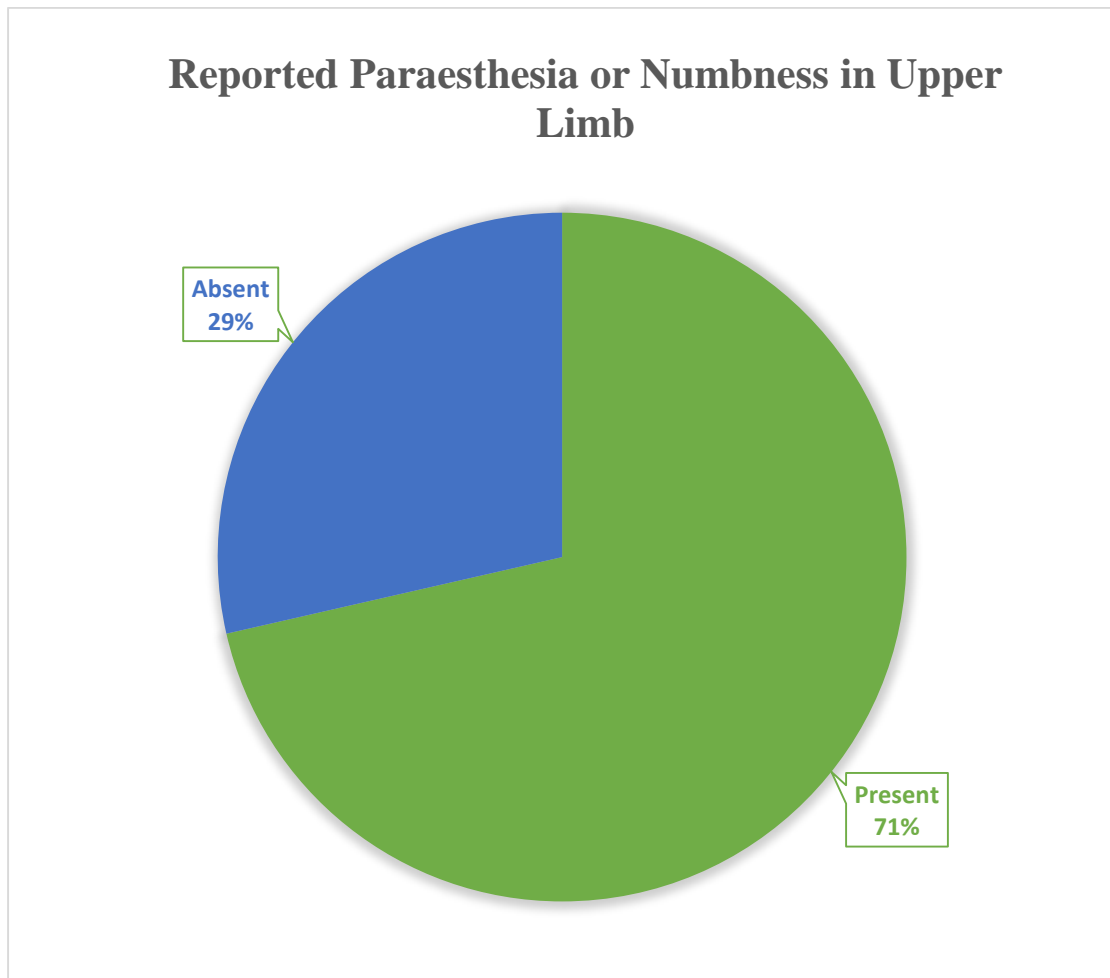


Figure - 5: Reported Paraesthesia and Numbness in the Upper Limb

Causes of Pain

According to the patients opinion, half of the patients that is 50% (n=7) were suffering from neck pain due to bad posture, 7% (n=1) were due to lifting heavy weight, 43% (n=6) were due to others or unknown causes of neck pain. No one was reported suffering due to trauma or injury to neck pain in the study.

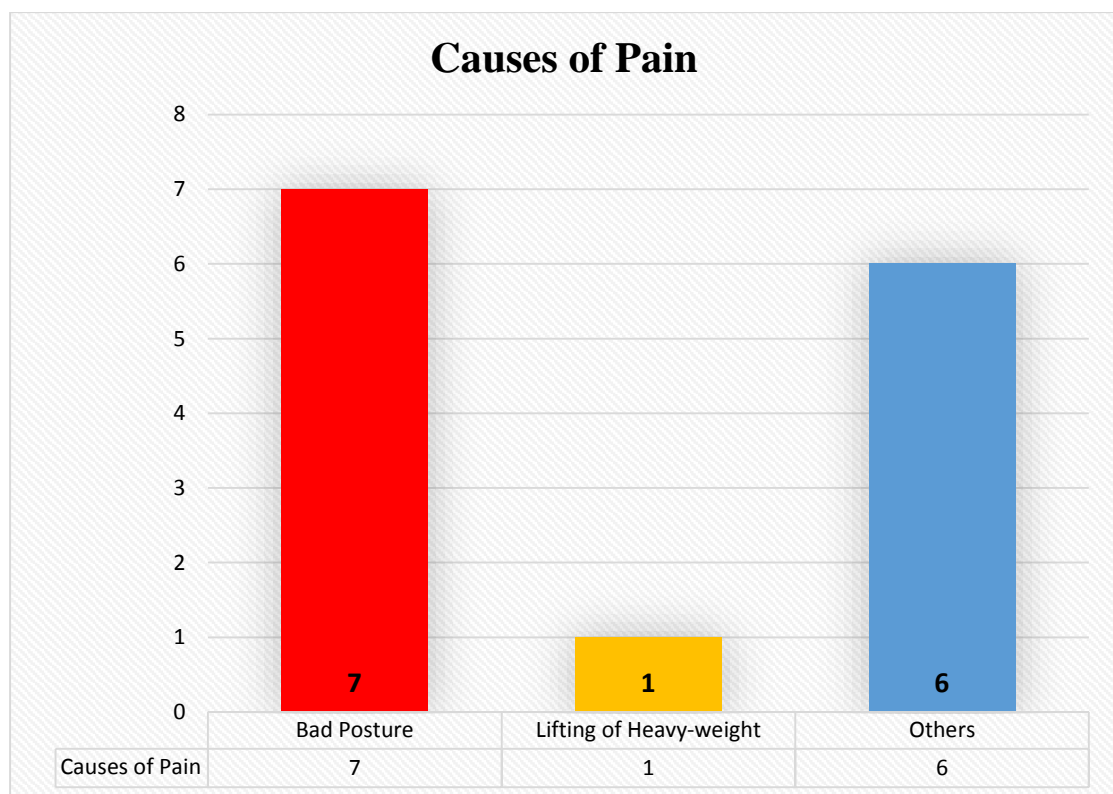


Figure - 6: Causes of Neck Pain as reported by the patients.

Frequency of taking treatment previously

Among 14 participants, 12 patients (about 60%) took Medicine (pain killer) for their neck pain. 5 patients (about 25%) used Cervical Collar, 2 patients (about 10%) took Rest and 1 patient (about 5%) took massage therapy for their neck pain and disability. None of them had any injection therapy, operation or any other methods of treatments previously.

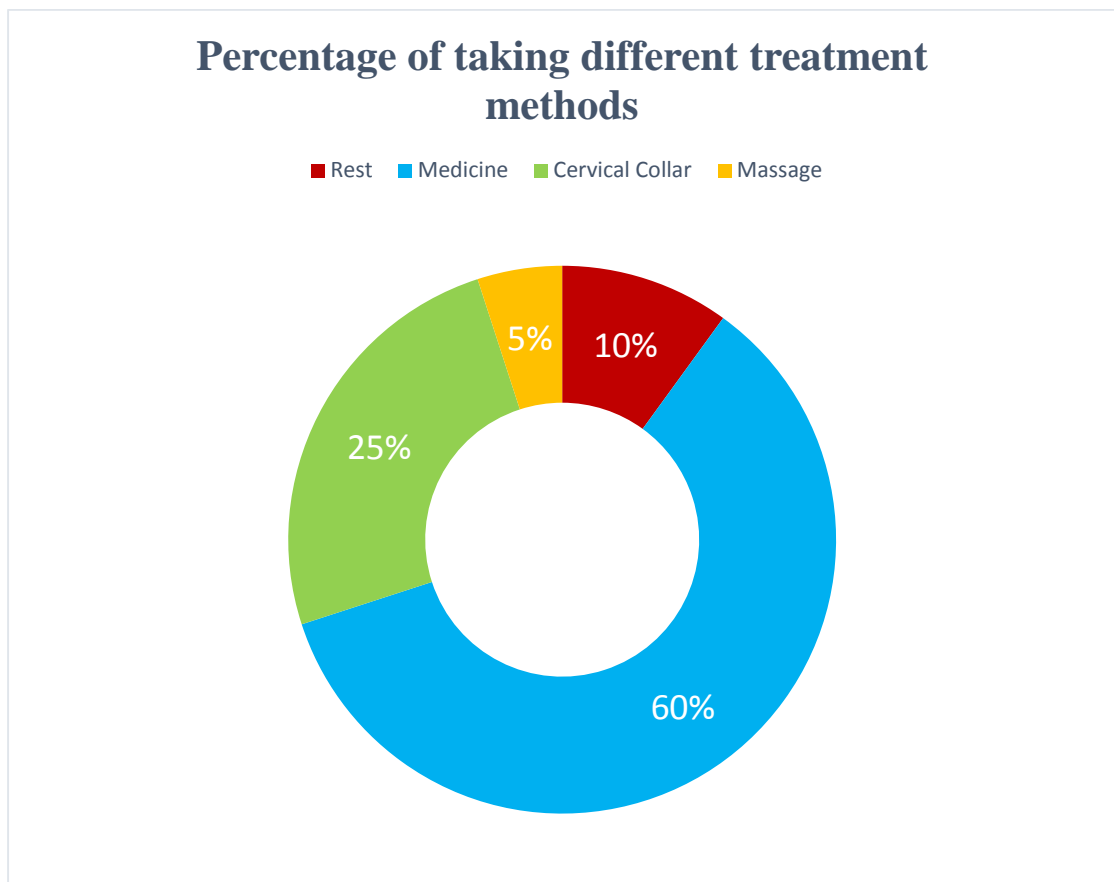


Figure - 7: Frequency of taking treatment previously

Pain progression

After taking previous treatment only 14% (n=2) patients complained that their pain was not changing and 79% (n=11) patients complained that their pain was worsening. Only 7% (n=1) patients told that their pain was improving.

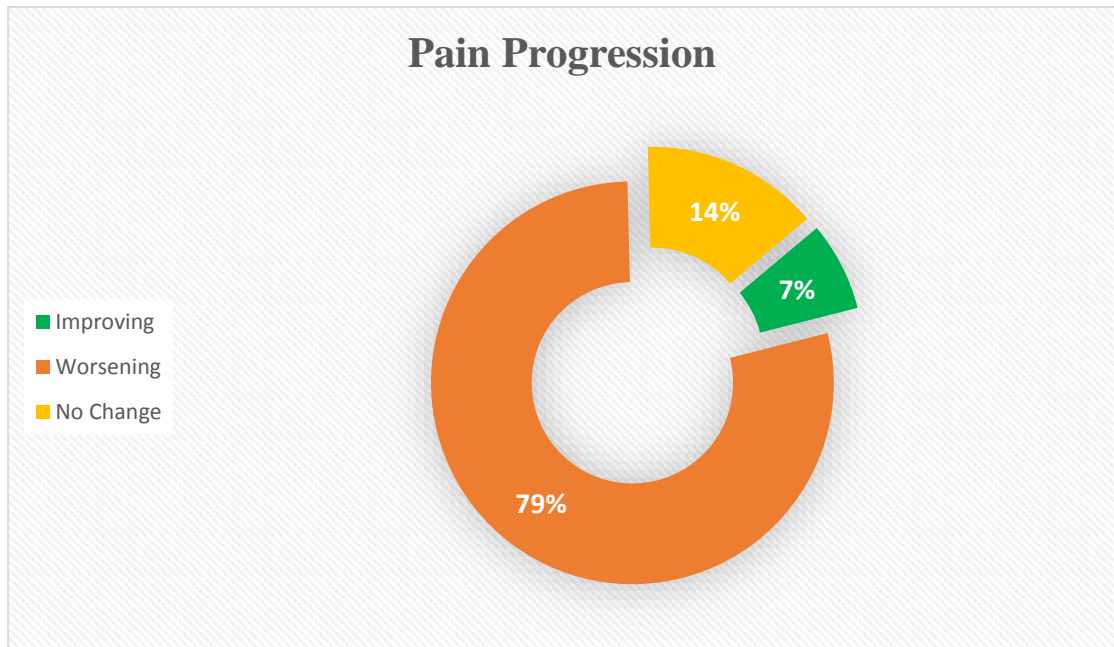


Figure - 8: Pain progression

Mean Difference of Pain Reduction in Control Group

Control Group	Neck Pain		Arm Pain		Forearm Pain	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Mean	6.4	3.1	6.7	3.4	7	3
Mean Difference	3.3		3.3		4	

Table – 3: Mean Difference of Pain Reduction in Control Group

Mean Difference of Pain Reduction in Experimental Group

Experimental Group	Neck Pain		Arm Pain		Forearm Pain	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Mean	7.1	1.8	5.8	1.3	6.3	1.3
Mean Difference	5.3		4.5		5	

Table – 4: Mean Difference of Pain Reduction in Experimental Group

The column chart is showing the mean difference of pain reduction rate for neck, arm and forearm pain in both experimental and control group.

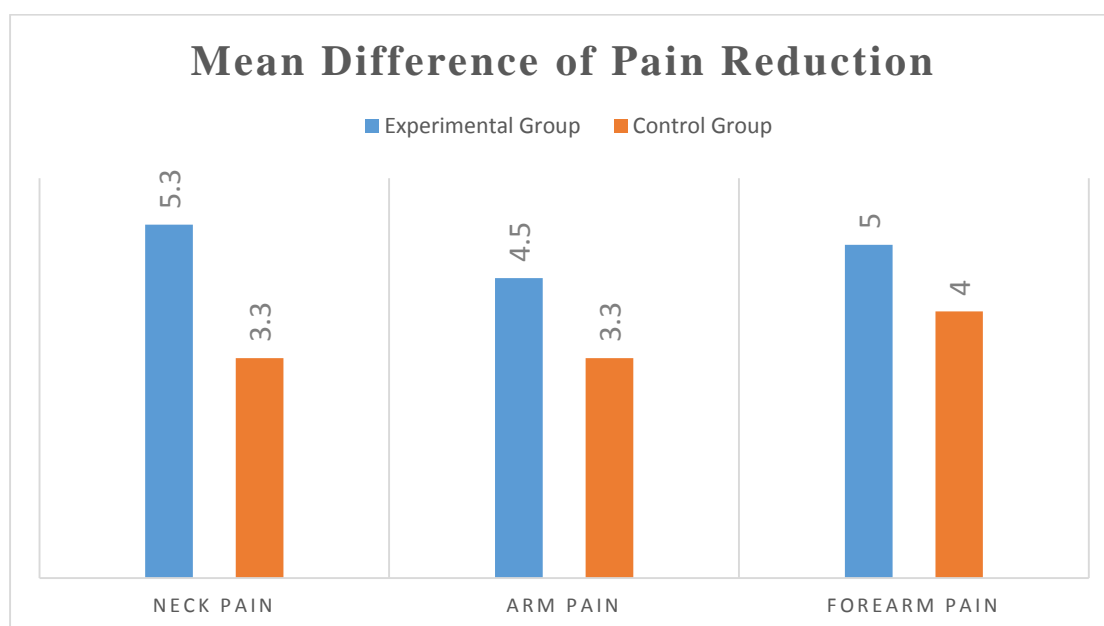


Figure – 9: Mean Difference of Pain Reduction

The data was analysed statistically by unrelated *t* test, in order to find out the statistical significance of the study. The results were found to be significant for *t* value at probability level 0.05. The interpretation is given below in the table -

Interpreting the Results of *t* test

	df	Level of Significance for one-tailed test at probability of 0.05		<i>t</i> value	probability level	Comments
Neck Pain	12	1.782	2.179	1.89	$p < 0.05$	significant
Arm Pain	11	1.796	2.201	1.812	$p < 0.05$	significant
Forearm Pain	4	2.132	2.776	2.503	$p < 0.05$	significant

Table – 5: Interpretation of *t* test Results

Mean Difference in Neck Disability Index of Control Group

Control Group	Neck Disability Score	
	Pre-test	Post-test
Mean	57.3	10.2
Mean Difference	47.1	

Table – 6: Mean Difference in NDI of Control Group

Mean Difference in Neck Disability Index of Experimental Group

Experimental Group	Neck Disability Score	
	Pre-test	Post-test
Mean	7.1	1.8
Mean Difference	5.3	

Table – 7: Mean Difference in NDI of Experimental Group

The column chart is showing the mean difference of neck disability reduction rate for both experimental and control group.

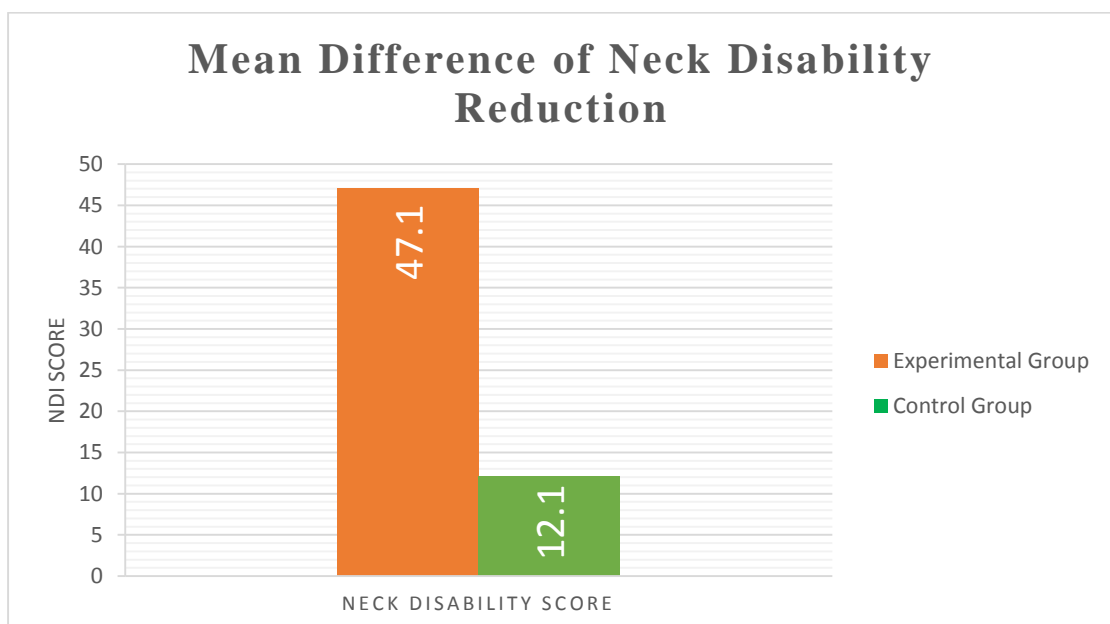


Figure – 10: Mean Difference of Neck Disability Reduction

The result of this study reported that the combination of Neural Mobilisation and McKenzie Approach (Directional Preference) is capable of producing beneficial effect for patients with Cervical Derangement Syndrome. The combination technique used in experimental group may be beneficial for reducing pain, functional disability in the subjects with cervical derangement syndrome.

The experimental design employed in this study is mainly suitable for a comprehensive investigation of the management of participating subjects (Sambyal & Kumar, 2013; Kumar, 2010). There was 14 participants in this study. They were distributed randomly in two groups of Experimental Group and Control Group. Experimental group received both Neural Mobilisation technique and McKenzie Approach (Directional Preference) as a combination treatment technique and the Control group received only McKenzie Approach (Directional Preference) for treatment of Cervical Derangement Syndrome.

As the study was done based on McKenzie Approach and techniques of neural mobilisation, and as the clinical settings of this study uses McKenzie Cervical Spine Assessment Form for provisionally classify the syndromes of neck pain complains, the age range was taken based on the theoretical basis of McKenzie Approach and its inclusion criteria. McKenzie (1990) stated age range from 12 – 60 found having frequency of cervical syndrome, where my study age range was 18 – 60 which includes within that range. He also stated, the incidence of neck pain found highest at the age of 45 to 50. In this study, the mean age of the participants was 39 in Experimental group and 42 in Control group. On the other hand, According to Krämer (2011), Intervertebral disc syndromes occurs commonly in middle age, the maximum of which is between forties and fifties of age and 68% is aged between 30 to 60 years. So it supports the samples of my study.

According to Krämer (2011), cervical syndromes affect equally in male and female. This also supports the male and female samples of my study. Because there was 50% male and 50% female participated in both control and experimental group in the study.

The subjects participated in this study fulfilled the symptomatic criteria for Cervical Derangement Syndrome and was found to meet the inclusion criteria and excluding the contraindications to the applied therapies (McKenzie & May, 2006).

The causes of pain due to Cervical Derangement Syndrome, its symptoms and signs was suggested to be neurogenic because of the types and distribution of the pain (McKenzie & May, 2006; Cowell & Philips, 2002).

The mean difference of pain reduction from both experimental and control group shows that the study was effective in reducing pain intensity and proves clinically significant. On the other hand, the mean difference of neck disability reduction from both groups also shows that the study was beneficial in terms of reducing disability and proves clinically significant.

The analysis of significance was carried out by using unrelated *t* test to compare the effectiveness of Neural Mobilisation technique along with McKenzie Approach (Directional Preference) as a combination therapy for management of pain and minimise disability of the patients with Cervical Derangement Syndrome as compared to McKenzie Approach (Directional Preference) alone.

By using an unrelated *t* test on the data the results were found to be significant ($p < 0.05$ for a one-tailed hypothesis). The null hypothesis can therefore be rejected. This means that Neural Mobilisation along with McKenzie Approach (Directional Preference) is more effective than McKenzie Approach (Directional Preference) only for reducing pain and disability in patients with Cervical Derangement Syndrome.

Kumar (2010) found in his study, statistically significant in McKenzie Approach group and Neural Mobilisation group separately. The Mean percentage of improvement in arm for McKenzie group was 73 % on 5th day and 96 % in 10th day with *t* value 3.467 and *p* value less than 0.02.

In this study, Researcher found reduction of pain in both control group and experimental group. But the comparison of both groups show that, Neural Mobilisation along with McKenzie Approach (Directional Preference) is effective in reducing neck pain and disability.

Limitations

The study was conducted within short period which is the main limitation of this study.

The study was conducted with 14 patients of Cervical Derangement Syndrome, which was a very small size of samples in both groups and was not sufficient enough for the study to generalize its findings to the wider population and variable patient mass of this condition.

There was no system of long term follow-up after the post-test of the study.

There was no available research done in this area in Bangladesh. So, relevant information about Cervical Derangement Syndrome patient with specific intervention for Bangladesh was very limited in this study.

CHAPTER – VI CONCLUSION AND RECOMMENDATION

The study was an experimental design to examine the effectiveness of Neural Mobilisation along with McKenzie Approach (Directional Preference) for Cervical Derangement Syndrome, where the results of the study have demonstrated that the combination technique is significantly capable of producing beneficial effects on pain reduction, functional disability minimization and cervical spinal mobility in patients with Cervical Derangement Syndrome.

Reduction of pain and associated symptoms were maximum in the patients treated with combination of Neural Mobilisation technique along with McKenzie Approach (Directional Preference), Range of Motion recovery as well as Reduction of Functional Disability was also found clinically significant.

The result also indicate that the significant changes in both groups are due to the selection of a well- defined population of mechanical neck pain patients using specific inclusion and exclusion criteria. It may be helpful for patient with mechanical neck pain to increase functional abilities for mechanical neck pain.

Despite the limitations of the study particularly small sample size, the results of the study give further motivation to controlled clinical trials with sufficient time and sample size. It could be also suggested that for further future study can be carried out with comparable patient variables with emphasis on ergometrics variables.

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ANNEXURE

1. Consent Form (Bengali Version)
2. Questionnaire (Bengali Version)
3. Consent Form (English Version)
4. Questionnaire (English Version)
5. Statistical Analysis
6. Statistical Probability Tables
7. Permission Letter

সম্মতিপত্র

আসসালামু আলাইকুম/নমস্কার, আমি রাফিউল করিম, ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে বাংলাদেশ হেলথ প্রফেশন ইনস্টিটিউট (বিএইচপিআই) এর ৪র্থ বর্ষ বি. এসসি. ইন ফিজিওথেরাপি বিভাগ এর একজন শিক্ষার্থী। অধ্যয়নের অংশ হিসেবে আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার প্রাতিষ্ঠানিক কাজের একটা অংশ। নিম্নোক্ত তথ্যাদি পাঠ করার পর অংশগ্রহণকারীদের অধ্যয়নে অংশগ্রহণের জন্য অনুরোধ করা হলো।

আমার গবেষণা শিরোনাম "ঘাড়ের সারভাইক্যাল ডিরেঞ্জমেন্ট সিড্রোম রোগীদের ক্ষেত্রে ম্যাকিনজি চিকিৎসা ব্যবস্থার সাথে নিউরাল মোবাইলিটেশন এর কার্যকারিতা"। এই গবেষণায় মাধ্যমে আমি ঘাড়ের ব্যাথার চিকিৎসার জন্য ম্যাকিনজি চিকিৎসা ব্যবস্থার সঙ্গে নিউরাল মোবাইলিটেশন এর কার্যকারিতা খুঁজে বের করার চেষ্টা করবো। আমার গবেষণার উদ্দেশ্য হলো থেরাপী দেবার পূর্বে ও পরে রোগীদের ব্যাথা, নড়াচড়া ও প্রতিবন্ধকতা পরিমাপ করা। আমি যদি আমার গবেষণাটি সার্থকভাবে সম্পূর্ণ করতে পারি তবে যেসব রোগীরা ঘাড়ের ব্যাথায় ভুগছেন তারা উপকৃত হবেন এবং এটি হবে একটি পরীক্ষামূলক প্রমাণ।

আমার গবেষণা প্রকল্প বাস্তবায়ন করার জন্য, আমি রোগীদের কাছ থেকে কিছু তথ্য সংগ্রহ করব। এজন্য আমি আপনার সাথে বেশ কয়েকবার দেখা করব। আমার গবেষণায় অংশগ্রহণে আপনার কোন ক্ষতি বা বিপদ হবে না। আপনি যে কোনো সময় নিজে থেকে এ গবেষণা থেকে প্রত্যাহার করতে পারেন। এই গবেষণার প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য আপনার অনুমতি ব্যতিরেকে অন্য কোথাও প্রকাশ করা হবে না।

আপনার গবেষণা সম্পর্কে যদি কোনো জিজ্ঞাসা থাকে তবে আপনি অনুগ্রহপূর্বক যোগাযোগ করতে পারেন গবেষক রাফিউল করিম অথবা মোহাম্মদ আনোয়ার হোসেন, সহযোগী অধ্যাপক এবং বিভাগীয় প্রধান, ফিজিওথেরাপি বিভাগ বিএইচপিআই, সিআরপি, সাভার, ঢাকা-১৩৪৩ এ যোগাযোগ করতে পারেন।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে ?

আমি কি শুরু করতে পারি ?

হ্যা

না

অংশগ্রহণকারীর স্বাক্ষর ও তারিখ

গবেষকের স্বাক্ষর ও তারিখ

সাক্ষীর স্বাক্ষর ও তারিখ

প্রশ্নাবলী (বাংলা)

পর্ব-ক: ব্যক্তিগত তথ্যাবলী

এই প্রশ্নপত্রটি তৈরি করা হয়েছে ঘাড়ের সারভাইক্যাল ডিরেঞ্জমেন্ট সিন্ড্রোম এর ব্যথার রোগীদের ব্যথা পরিমাপ করার জন্য। ব্যক্তিগত তথ্যাবলী অংশটি ফিজিওথেরাপিস্ট/গবেষক কালো/নীল কলমের দ্বারা পূরণ করবেন।

কোড নংঃ

তারিখঃ

রোগীর নামঃ

লিঙ্গঃ

বয়সঃ

পেশাঃ

ঠিকানাঃ

ফোন নম্বরঃ

১. আপনি কতদিন যাবত ঘাড়ের ব্যথায় ভুগছেন?

বছর মাস সপ্তাহ

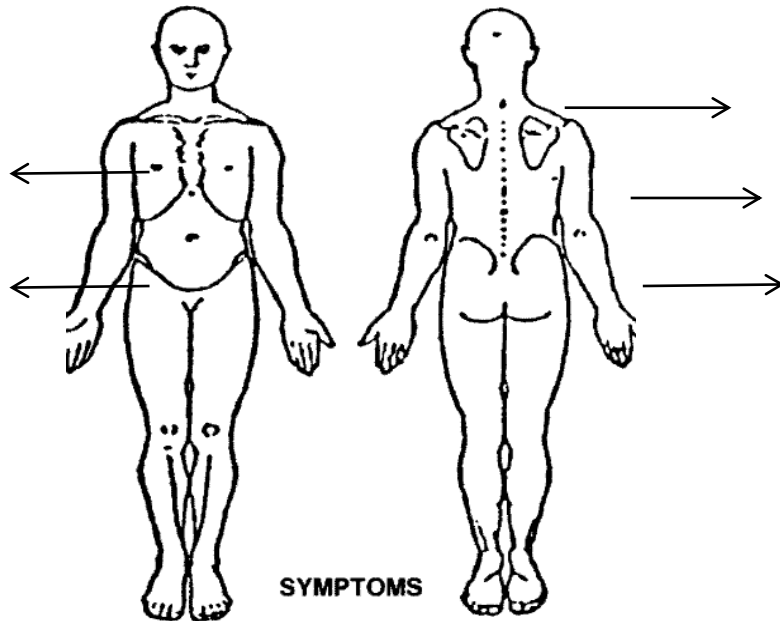
আপনার ঘাড়ের ব্যথা কোন পাশে বেশি?

১ ডান পাশে

২ বাম পাশে

৩ মাঝখানে

৪ উভয় পাশে সমান



২। আপনার কী বাহুতে কোন ব্যাথা আছে? ১ হ্যাঁ ২ না

যদি থাকে, তবে আপনি কতদিন ধরে বাহুর ব্যাথায় ভুগছেন?

বছর মাস সপ্তাহ

আপনার বাহুর ব্যাথা কোন পাশে বেশি? (সঠিক উত্তর এর পাশে টিক চিহ্ন দিন)

১ ডান ২ বাম ৩ উভয়

৩। আপনার কী হাতে কোন ব্যাথা আছে? ১ হ্যাঁ ২ না

যদি থাকে, তবে আপনি কতদিন ধরে হাতের ব্যাথায় ভুগছেন?

বছর মাস সপ্তাহ

আপনার হাতের ব্যাথা কোন পাশে বেশি? (সঠিক উত্তর এর পাশে টিক চিহ্ন দিন)

১ ডান পাশে ২ বাম পাশে ৩ উভয় পাশে সমান

৪। আপনার ব্যাথা কোথায় বেশি?

১ ঘাড়ের ব্যাথা হাতের ব্যাথার চেয়ে বেশি

২ হাত-এর ব্যাথা ঘাড়ের এর ব্যাথার চেয়ে বেশি

৩ ঘাড় ও হাতের ব্যাথা সমান।

৫। আপনার হাতে কি দুর্বলতা অনুভব করেন? ১ হ্যাঁ ২ না

আপনার হাতের দুর্বলতা কোন পাশে বেশি? (সঠিক উত্তর এর পাশে টিক চিহ্ন দিন)

১ ডান পাশে ২ বাম পাশে ৩ উভয় পাশে সমান

৬। আপনার হাতে কি অসাড়া অনুভব করেন? ১ হ্যাঁ ২ না

আপনার হাতের অসাড়া কোন পাশে বেশি? (সঠিক উত্তর এর পাশে টিক চিহ্ন দিন)

১ ডান পাশে ২ বাম পাশে ৩ উভয় পাশে সমান

৭। আপনার ব্যাথা করে নিম্নলিখিত	খারাপ	ভাল	অপরিবর্তিত
ক) চিত হয়ে শুলে	<input type="checkbox"/> ১	<input type="checkbox"/> ২	<input type="checkbox"/> ৩
খ) কাত হয়ে শুলে	<input type="checkbox"/> ১	<input type="checkbox"/> ২	<input type="checkbox"/> ৩
গ) ঘাড় ঘুরালে	<input type="checkbox"/> ১	<input type="checkbox"/> ২	<input type="checkbox"/> ৩
ঘ) সামনের দিকে ঝুকলে	<input type="checkbox"/> ১	<input type="checkbox"/> ২	<input type="checkbox"/> ৩
ঙ) বসে থাকলে	<input type="checkbox"/> ১	<input type="checkbox"/> ২	<input type="checkbox"/> ৩
চ) উঠতে গেলে	<input type="checkbox"/> ১	<input type="checkbox"/> ২	<input type="checkbox"/> ৩
ছ) কাশি / হাঁচি দিলে	<input type="checkbox"/> ১	<input type="checkbox"/> ২	<input type="checkbox"/> ৩

৮। আপনার ব্যাথা কি কারণে সৃষ্টি হয়েছে বলে আপনি মনে করেন? (সঠিক উত্তর এর পাশে টিক চিহ্ন দিন)

১ কোন আঘাতের ফলে

২ ত্রুটিপূর্ণ দেহভঙ্গি

৩ কোন ভারি বস্তু তুলতে গিয়ে

৪ অন্যান্য

৯। আপনার ব্যাথা কখন তীব্র হয়? (সঠিক উত্তর এর পাশে টিক চিহ্ন দিন)

১ সকালে

২ সন্ধ্যায়

৩ দিন বাড়ার সাথে সাথে

৪ সারাদিন

১০। এখানে আসার আগে পর্যন্ত আপনি কী কী ধরনের চিকিৎসা নিয়েছেন?

ক) বিশ্রাম ১ হ্যাঁ ২ না

খ) ঔষধ ১ হ্যাঁ ২ না

গ) সারভাইকাল কলার ১ হ্যাঁ ২ না

ঘ) ফিজিওথেরাপি ১ হ্যাঁ ২ না

ঙ) ম্যাসেজ ১ হ্যাঁ ২ না

চ) ইনজেকশন ১ হ্যাঁ ২ না

ছ) অস্ত্রোপচার ১ হ্যাঁ ২ না

জ) অন্যান্য

১ হ্যাঁ

২ না

১১। আপনার সমস্যাটির অগ্রগতি কেমন? (সঠিক উত্তর এর পাশে টিক চিহ্ন দিন)

১ উন্নতির দিকে

২ অপরিবর্তিত

৩ অবনতির দিকে

পর্ব-খ: ব্যাথার অবস্থা পরিমাপ

McCaffery & Beebe (1999) রোগীদের ব্যাথার অভিজ্ঞতা ব্যাখ্যা করার জন্য নিওমারিক পেইন রেটিং স্কেল ব্যবহার করেন। এটা সংখ্যাসূচক ব্যাথা নির্ধারক স্কেল হিসাবে পরিচিত। এখানে স্কেলে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

প্রশ্নাবলীর এই অংশে একটি কালো বা নীল রঙীন বল কলম ব্যবহার করে রোগীর দ্বারা পূরণ করা হবে। রোগী কোন প্রশ্ন মানে বুঝতে না পারলে, ফিজিওথেরাপিস্টকে নির্দিষ্ট অংশের অর্থ পরিষ্কার করতে অনুরোধ করা হল।

এখানে কিছু প্রশ্ন আছে এবং প্রতিটি প্রশ্নের সঙ্গে একটি দীর্ঘ লাইন আছে। লাইনটি ব্যাথার পরিস্থিতি উপস্থাপন করে, বাম হাতের দিকে শূন্য (০) কোন ব্যাথা নেই এবং ডান হাতের দিকে দশ (১০) তীব্র ব্যাথা মানে প্রতিনিধিত্ব করে। নিম্নলিখিত প্রশ্নে আপনার ব্যাথার পরিমাণ লাইন চিহ্নিত করুন।

উদাহরণ স্বরূপঃ

যদি কারো ঘাড়ের ব্যাথার পরিমাণ হয় ৭ থেকে ৯ এর মধ্যে তাহলে তিনি পূরণ করবেন-

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

১। আজকে আপনার ঘাড়ের ব্যাথার তীব্রতা কতোটুকু?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

২। আজকে আপনার বাহুর ব্যাথার তীব্রতা কতোটুকু?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

৩। আজকে আপনার হাত-এর ব্যাথার তীব্রতা কতোটুকু?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

পর্ব- গ ঘাড়ের অক্ষমতা সূচক প্রশ্নাবলী

এই প্রশ্নাবলী আপনার ঘাড় ব্যথা দৈনন্দিন জীবন পরিচালনা করার জন্য আপনার ক্ষমতাকে কিভাবে প্রভাবিত করেছে সে সম্বন্ধে আমাদের তথ্য দিতে তৈরি করা হয়েছে।

আপনি দয়া করে নীচের প্রতিটি বিভাগ হতে যেকোন একটি উক্তি টিক দিয়ে চিহ্নিত করুন যেটি আপনার বর্তমান অবস্থাকে সবচেয়ে ভালভাবে ব্যখ্যা করে।

অনুচ্ছেদ ১: ব্যথার তীব্রতা

- আমার এই মুহূর্তে কোন ব্যথা নেই
- আমার এই মুহূর্তে খুব হালকা ব্যথা আছে
- আমার এই মুহূর্তে মাঝারি ব্যথা আছে
- আমার এই মুহূর্তে ব্যথা মোটামুটি গুরুতর
- আমার এই মুহূর্তে ব্যথা খুব গুরুতর
- আমার এই মুহূর্তে ব্যথা সবচেয়ে খারাপ

অনুচ্ছেদ ২: নিজের দেখাশোনা বা ব্যক্তিগত যত্ন (কাপড় ধৌতকরণ, পরিধান ইত্যাদি)

- আমি সাধারণত অতিরিক্ত ব্যথা ছাড়াই নিজেকে দেখাশোনা করার কাজ করতে পারি
- আমি সাধারণত নিজেকে দেখাশোনা করতে পারি কিন্তু এতে অতিরিক্ত ব্যথা হয়
- আমি নিজেকে দেখাশোনা করার কাজ করতে গেলে ব্যথা অনুভব করি এবং আমি ধীরগতি এবং সতর্কতা অবলম্বন করি
- আমাকে সামান্য সাহায্য করলে আমি আমার ব্যক্তিগত যত্নের অধিকাংশ কাজই পরিচালনা করতে পারি
- আমার নিজের যত্নের অধিকাংশ ক্ষেত্রেই প্রতিদিনই সাহায্য প্রয়োজন হয়
- আমি কাপড় পরিধান করতে পারি না, আমার কাপড় ধৌত করতে অসুবিধা হয় এবং বিছানায় শুয়ে থাকতে হয়

অনুচ্ছেদ ৩: উত্তোলন

- আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন উত্তোলন করতে পারি
- আমি ভারী ওজন উত্তোলন করতে পারি কিন্তু এটা অতিরিক্ত ব্যথা দেয়
- ব্যথা আমাকে মেঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি তা পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে, উদাহরণস্বরূপ, কোন একটি টেবিল এর উপর থেকে
- ব্যথা আমাকে মেঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি মাঝারি থেকে হালকা ওজন উত্তোলন করতে পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে
- আমি শুধুমাত্র খুব হালকা ওজন উত্তোলন করতে পারি

- আমি কোন কিছু উত্তোলন বা কিছু বহন করতে পারি না

অনুচ্ছেদ ৪: পড়া

- আমি আমার ঘাড়ে কোন ব্যথা ছাড়াই যতটা আমি চাই ততটাই পড়তে পারি
- আমি আমার ঘাড়ে সামান্য ব্যথা নিয়ে যতটা আমি চাই পড়তে পারি
- আমি আমার ঘাড়ে সহনীয় ব্যথা নিয়ে যতটা আমি চাই পড়তে পারি
- আমি আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতটা চাই পড়তে পারি না
- আমি আমার ঘাড়ে তীব্র ব্যথার কারণে খুব কমই পড়তে পারি
- আমি ব্যথার কারণে একদমই পড়তে পারি না

অনুচ্ছেদ ৫: মাথাব্যথা

- আমার কোন মাথাব্যথাই নেই
- আমার সামান্য মাথাব্যথা আছে, যা কদাচিৎ আসে
- আমার সহনীয় মাথাব্যথা আছে, যা কদাচিৎ আসে
- আমার সহনীয় মাথাব্যথা আছে, যা ঘন ঘন আসে
- আমার তীব্র মাথাব্যথা আছে, যা ঘন ঘন আসে
- আমার প্রায় সব সময় মাথাব্যথা হয়

অনুচ্ছেদ ৬: মনোযোগ

- আমি কোন অসুবিধা ছাড়াই যখন চাই তখনই আমি সম্পূর্ণরূপে মনোযোগ দিতে পারি
- আমি সামান্য অসুবিধার সঙ্গে যখন চাই তখনই আমি সম্পূর্ণরূপে মনোযোগ দিতে পারি
- আমি যখন মনোযোগ দিতে চাই তখন চলনসই মাত্রার অসুবিধা হয়
- আমি যখন মনোযোগ দিতে চাই তখন অনেক অসুবিধা হয়
- আমি যখন মনোযোগ দিতে চাই তখন গুরুতর অসুবিধা হয়
- আমি একদমই মনোযোগ দিতে পারি না

অনুচ্ছেদ ৭: কাজ

- আমি যত চাই তত কাজ করতে পারি
- আমি শুধুমাত্র আমার স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশি না
- আমি আমার অধিকাংশ স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশি না

- আমি আমার স্বাভাবিক কাজ করতে পারি না
- আমি খুব কমই কোন কাজ করতে পারি
- আমি একদমই কোন কাজ করতে পারি না

অনুচ্ছেদ ৮: গাড়ি চালনা

- আমি কোনো ঘাড় ব্যথা ছাড়াই আমার গাড়ী চালনা করতে পারি
- আমি আমার ঘাড়ে সামান্য ব্যথা নিয়ে যতক্ষণ দীর্ঘ খুশি ততক্ষণ আমার গাড়ী চালনা করতে পারি
- আমি আমার ঘাড়ে সহনীয় ব্যথা নিয়ে যতক্ষণ দীর্ঘ খুশি ততক্ষণ আমার গাড়ী চালনা করতে পারি
- আমি আমার ঘাড়ে মাঝারি ব্যথার কারণে যতক্ষণ দীর্ঘ খুশি ততক্ষণ আমার গাড়ী চালনা করতে পারি না
- আমি আমার ঘাড়ে তীব্র ব্যথার কারণে গাড়ী চালনা করতে পারি না
- আমি একদমই আমার গাড়ী চালনা করতে পারি না

অনুচ্ছেদ ৯: ঘুম

- আমার ঘুম আসতে কোন কষ্ট হয় না
- আমার ঘুম আসতে সামান্য সমস্যা হয় (১ ঘন্টার কম সময় নিঘুম কাটে)
- আমার ঘুম আসতে সমস্যা হয় (১ থেকে ২ ঘন্টা নিঘুম কাটে)
- আমার ঘুম পরিমিতরূপে নষ্ট হয় (২ থেকে ৩ ঘন্টা নিঘুম কাটে)
- আমার ঘুম ব্যাপকভাবে নষ্ট হয় (৩ থেকে ৫ ঘন্টা নিঘুম কাটে)
- আমার ঘুম সম্পূর্ণভাবে নষ্ট হয় (৫ থেকে ৭ ঘন্টা নিঘুম কাটে)

অনুচ্ছেদ ১০: চিত্তবিনোদন কার্যক্রম

- আমি আমার ঘাড়ে কোন ব্যথা ছাড়াই সব চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি
- আমি আমার ঘাড়ে কিছু ব্যথা নিয়ে সব চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি
- আমি আমার ঘাড়ে ব্যথার কারণে অধিকাংশ কার্যক্রমে অংশগ্রহন করতে পারছি, কিন্তু আমার সকল স্বাভাবিক চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি না
- আমি আমার ঘাড়ে ব্যথার কারণে আমার স্বাভাবিক চিত্তবিনোদন কার্যক্রমের কয়েকটি কাজে নিয়োজিত হতে পারছি
- আমি আমার ঘাড়ে ব্যথার কারণে আমার স্বাভাবিক চিত্তবিনোদন কার্যক্রমের খুবই কম কাজে নিয়োজিত হতে পারছি
- আমি একদমই কোন চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি না

Score: /50 **Transform to percentage score x 100 = % points**

Scoring:

For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked it = 5.

If all ten sections are completed the score is calculated as follows:

Example:

16 (total scored)

50 (total possible score) x 100 = 32%

If one section is missed or not applicable the score is calculated: 16 (total scored)

45 (total possible score) x 100 = 35.5%

Minimum Detectable Change (90% confidence): 5 points or 10 %points

চিকিৎসা পরবর্তী প্রশ্নাবলী (বাংলা)

পর্ব-ক: ব্যক্তিগত তথ্যাবলী

এই প্রশ্নপত্রটি তৈরি করা হয়েছে ঘাড়ে সারভাইক্যাল ডিরেঞ্জমেন্ট সিন্ড্রোম এর ব্যথার রোগীদের ব্যাথা পরিমাপ করার জন্য। ব্যক্তিগত তথ্যাবলী অংশটি ফিজিওথেরাপিস্ট/গবেষক কালো/নীল কলমের দ্বারা পূরণ করবেন।

কোড নংঃ

তারিখঃ

রোগীর নামঃ

লিঙ্গঃ

বয়সঃ

পেশাঃ

ঠিকানাঃ

ফোন নম্বরঃ

পর্ব-খ: ব্যাথার অবস্থা পরিমাপ

McCaffery & Beebe (1999) রোগীদের ব্যাথার অভিজ্ঞতা ব্যাখ্যা করার জন্য নিওমারিক পেইন রেটিং স্কেল ব্যবহার করেন। এটা সংখ্যাসূচক ব্যাথা নির্ধারক স্কেল হিসাবে পরিচিত। এখানে স্কেলে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

প্রশ্নাবলীর এই অংশে একটি কালো বা নীল রঙীন বল কলম ব্যবহার করে রোগীর দ্বারা পূরণ করা হবে। রোগী কোন প্রশ্ন মানে বুঝতে না পারলে, ফিজিওথেরাপিস্টকে নির্দিষ্ট অংশের অর্থ পরিষ্কার করতে অনুরোধ করা হল।

এখানে কিছু প্রশ্ন আছে এবং প্রতিটি প্রশ্নের সঙ্গে একটি দীর্ঘ লাইন আছে। লাইনটি ব্যাথার পরিস্থিতি উপস্থাপন করে, বাম হাতের দিকে শূন্য (০) কোন ব্যাথা নেই এবং ডান হাতের দিকে দশ (১০) তীব্র ব্যাথা মানে প্রতিনিধিত্ব করে। নিম্নলিখিত প্রশ্নে আপনার ব্যাথার পরিমাণ লাইন চিহ্নিত করুন।

উদাহরণ স্বরূপঃ

যদি কারো ঘাড়ের ব্যাথার পরিমাণ হয় ৭ থেকে ৯ এর মধ্যে তাহলে তিনি পূরণ করবেন-

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

১। আজকে আপনার ঘাড়ের ব্যাথার তীব্রতা কতোটুকু?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

২। আজকে আপনার বাহুর ব্যাথার তীব্রতা কতোটুকু?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

৩। আজকে আপনার হাত-এর ব্যাথার তীব্রতা কতোটুকু?

০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০

এখানে শূন্য (০) মানে কোন ব্যাথা নেই (১-৩) মানে হালকা ব্যাথা (৪-৬) মানে সহনীয় ব্যাথা এবং (৭-১০) মানে তীব্র ব্যাথা।

পর্ব- গ ঘাড়ের অক্ষমতা সূচক প্রশ্নাবলী

এই প্রশ্নাবলী আপনার ঘাড় ব্যথা দৈনন্দিন জীবন পরিচালনা করার জন্য আপনার ক্ষমতাকে কিভাবে প্রভাবিত করেছে সে সম্বন্ধে আমাদের তথ্য দিতে তৈরি করা হয়েছে।

আপনি দয়া করে নীচের প্রতিটি বিভাগ হতে যেকোন একটি উক্তি টিক দিয়ে চিহ্নিত করুন যেটি আপনার বর্তমান অবস্থাকে সবচেয়ে ভালভাবে ব্যখ্যা করে।

অনুচ্ছেদ ১: ব্যথার তীব্রতা

- আমার এই মুহূর্তে কোন ব্যথা নেই
- আমার এই মুহূর্তে খুব হালকা ব্যথা আছে
- আমার এই মুহূর্তে মাঝারি ব্যথা আছে
- আমার এই মুহূর্তে ব্যথা মোটামুটি গুরুতর
- আমার এই মুহূর্তে ব্যথা খুব গুরুতর
- আমার এই মুহূর্তে ব্যথা সবচেয়ে খারাপ

অনুচ্ছেদ ২: নিজের দেখাশোনা বা ব্যক্তিগত যত্ন (কাপড় ধৌতকরণ, পরিধান ইত্যাদি)

- আমি সাধারণত অতিরিক্ত ব্যথা ছাড়াই নিজেকে দেখাশোনা করার কাজ করতে পারি
- আমি সাধারণত নিজেকে দেখাশোনা করতে পারি কিন্তু এতে অতিরিক্ত ব্যথা হয়
- আমি নিজেকে দেখাশোনা করার কাজ করতে গেলে ব্যথা অনুভব করি এবং আমি ধীরগতি এবং সতর্কতা অবলম্বন করি
- আমাকে সামান্য সাহায্য করলে আমি আমার ব্যক্তিগত যত্নের অধিকাংশ কাজই পরিচালনা করতে পারি
- আমার নিজের যত্নের অধিকাংশ ক্ষেত্রেই প্রতিদিনই সাহায্য প্রয়োজন হয়
- আমি কাপড় পরিধান করতে পারি না, আমার কাপড় ধৌত করতে অসুবিধা হয় এবং বিছানায় শুয়ে থাকতে হয়

অনুচ্ছেদ ৩: উত্তোলন

- আমি অতিরিক্ত ব্যথা ছাড়াই ভারী ওজন উত্তোলন করতে পারি
- আমি ভারী ওজন উত্তোলন করতে পারি কিন্তু এটা অতিরিক্ত ব্যথা দেয়
- ব্যথা আমাকে মেঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি তা পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে, উদাহরণস্বরূপ, কোন একটি টেবিল এর উপর থেকে
- ব্যথা আমাকে মেঝে থেকে ভারী ওজন উত্তোলন করতে বাধা দেয়, কিন্তু আমি মাঝারি থেকে হালকা ওজন উত্তোলন করতে পারি যদি সেটা সুবিধামত কোথাও স্থাপন করা থাকে
- আমি শুধুমাত্র খুব হালকা ওজন উত্তোলন করতে পারি

- আমি কোন কিছু উত্তোলন বা কিছু বহন করতে পারি না

অনুচ্ছেদ ৪: পড়া

- আমি আমার ঘাড়ে কোন ব্যথা ছাড়াই যতটা আমি চাই ততটাই পড়তে পারি
- আমি আমার ঘাড়ে সামান্য ব্যথা নিয়ে যতটা আমি চাই পড়তে পারি
- আমি আমার ঘাড়ে সহনীয় ব্যথা নিয়ে যতটা আমি চাই পড়তে পারি
- আমি আমার ঘাড়ে মাঝারি ব্যথার কারণে আমি যতটা চাই পড়তে পারি না
- আমি আমার ঘাড়ে তীব্র ব্যথার কারণে খুব কমই পড়তে পারি
- আমি ব্যথার কারণে একদমই পড়তে পারি না

অনুচ্ছেদ ৫: মাথাব্যথা

- আমার কোন মাথাব্যথাই নেই
- আমার সামান্য মাথাব্যথা আছে, যা কদাচিৎ আসে
- আমার সহনীয় মাথাব্যথা আছে, যা কদাচিৎ আসে
- আমার সহনীয় মাথাব্যথা আছে, যা ঘন ঘন আসে
- আমার তীব্র মাথাব্যথা আছে, যা ঘন ঘন আসে
- আমার প্রায় সব সময় মাথাব্যথা হয়

অনুচ্ছেদ ৬: মনোযোগ

- আমি কোন অসুবিধা ছাড়াই যখন চাই তখনই আমি সম্পূর্ণরূপে মনোযোগ দিতে পারি
- আমি সামান্য অসুবিধার সঙ্গে যখন চাই তখনই আমি সম্পূর্ণরূপে মনোযোগ দিতে পারি
- আমি যখন মনোযোগ দিতে চাই তখন চলনসই মাত্রার অসুবিধা হয়
- আমি যখন মনোযোগ দিতে চাই তখন অনেক অসুবিধা হয়
- আমি যখন মনোযোগ দিতে চাই তখন গুরুতর অসুবিধা হয়
- আমি একদমই মনোযোগ দিতে পারি না

অনুচ্ছেদ ৭: কাজ

- আমি যত চাই তত কাজ করতে পারি
- আমি শুধুমাত্র আমার স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশি না
- আমি আমার অধিকাংশ স্বাভাবিক কাজ করতে পারি, কিন্তু এর বেশি না
- আমি আমার স্বাভাবিক কাজ করতে পারি না

- আমি খুব কমই কোন কাজ করতে পারি
- আমি একদমই কোন কাজ করতে পারি না

অনুচ্ছেদ ৮: গাড়ি চালনা

- আমি কোনো ঘাড় ব্যথা ছাড়াই আমার গাড়ী চালনা করতে পারি
- আমি আমার ঘাড়ে সামান্য ব্যথা নিয়ে যতক্ষণ দীর্ঘ খুশি ততক্ষণ আমার গাড়ী চালনা করতে পারি
- আমি আমার ঘাড়ে সহনীয় ব্যথা নিয়ে যতক্ষণ দীর্ঘ খুশি ততক্ষণ আমার গাড়ী চালনা করতে পারি
- আমি আমার ঘাড়ে মাঝারি ব্যথার কারণে যতক্ষণ দীর্ঘ খুশি ততক্ষণ আমার গাড়ী চালনা করতে পারি না
- আমি আমার ঘাড়ে তীব্র ব্যথার কারণে গাড়ী চালনা করতে পারি না
- আমি একদমই আমার গাড়ী চালনা করতে পারি না

অনুচ্ছেদ ৯: ঘুম

- আমার ঘুম আসতে কোন কষ্ট হয় না
- আমার ঘুম আসতে সামান্য সমস্যা হয় (১ ঘন্টার কম সময় নিঘুম কাটে)
- আমার ঘুম আসতে সমস্যা হয় (১ থেকে ২ ঘন্টা নিঘুম কাটে)
- আমার ঘুম পরিমিতরূপে নষ্ট হয় (২ থেকে ৩ ঘন্টা নিঘুম কাটে)
- আমার ঘুম ব্যাপকভাবে নষ্ট হয় (৩ থেকে ৫ ঘন্টা নিঘুম কাটে)
- আমার ঘুম সম্পূর্ণভাবে নষ্ট হয় (৫ থেকে ৭ ঘন্টা নিঘুম কাটে)

অনুচ্ছেদ ১০: চিত্তবিনোদন কার্যক্রম

- আমি আমার ঘাড়ে কোন ব্যথা ছাড়াই সব চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি
- আমি আমার ঘাড়ে কিছু ব্যথা নিয়ে সব চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি
- আমি আমার ঘাড়ে ব্যথার কারণে অধিকাংশ কার্যক্রমে অংশগ্রহন করতে পারছি, কিন্তু আমার সকল স্বাভাবিক চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি না
- আমি আমার ঘাড়ে ব্যথার কারণে আমার স্বাভাবিক চিত্তবিনোদন কার্যক্রমের কয়েকটি কাজে নিয়োজিত হতে পারছি
- আমি আমার ঘাড়ে ব্যথার কারণে আমার স্বাভাবিক চিত্তবিনোদন কার্যক্রমের খুবই কম কাজে নিয়োজিত হতে পারছি
- আমি একদমই কোন চিত্তবিনোদন কার্যক্রমে অংশগ্রহন করতে পারছি না

Score: /50 **Transform to percentage score x 100 = % points**

Scoring:

For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked it = 5.

If all ten sections are completed the score is calculated as follows:

Example:

16 (total scored)

50 (total possible score) x 100 = 32%

If one section is missed or not applicable the score is calculated: 16 (total scored)

45 (total possible score) x 100 = 35.5%

Minimum Detectable Change (90% confidence): 5 points or 10 %points

Consent Form

Assalamualaikum\Namashker, I am Rafiul Karim, 4th Professional B.Sc. in Physiotherapy student of Bangladesh Health Professions Institute (BHPI) under Medicine faculty of University of Dhaka. To obtain my Bachelor degree, I shall have to conduct a research and it is a part of my study. The participants are requested to participate in the study after reading the following.

My research title is “**Effectiveness of Neural Mobilisation along with McKenzie Approach (Directional Preference) for Cervical Derangement Syndrome**”.

Through this study I will find the effectiveness Neural Mobilisation technique along with McKenzie Approach (Directional Preference) for the treatment of Cervical Derangement Syndrome causing Neck Pain and Disability. If I can complete this study successfully, patient may get the benefits who have been suffering from this condition and it will be an evidence based treatment.

To fulfil my research project, I need to collect data. Considering the area of my research, which criteria is necessary for my research is present of you. So, you can be a respected participant of my research and I would like to request you as a subject of my study. I want to meet you a few couple of session, during your regular therapy. The exercises that will be given are pain free and safe for you.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. I assure that all data will be kept confidential. Your participation will be voluntary. You may have the right to withdraw consent and discontinue participation at any time of the experiment. You also have the right to answer a particular question that you don't like.

If you have any query about the study or right as a participant, you may contact with me.

Do you have any questions before I start?

So, may I have your consent to proceed with the interview?

Yes

No

Signature of the participant & Date.....

Signature of the researcher & Date.....

Signature of the witness & Date.....

Questionnaire (English Version)
SECTION-A: Subjective Information

This questionnaire is developed to measure the pain of the patient with Cervical Derangement Syndrome and this portion will be filled by physiotherapist/researcher using a pencil.

Code No:

Date:

Patient's name:

Sex: M / F

Age:

Occupation:

Address:

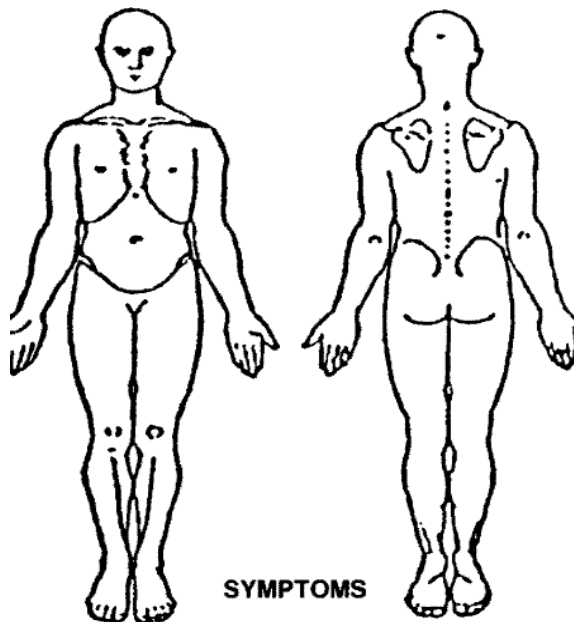
Contact No:

1. How long have you been suffering from neck pain?

Years..... Months..... Weeks.....

In which side of your neck pain is more?

1. Right 2. Left 3. Middle 4. Both



2. Do you have any pain on your arm?

Yes No.....

If yes, how long have you been suffering from arm pain?

Years..... Months..... Weeks.....

And which side is affected?

Right Left Both

3. Do you have any pain on your forearm?

Yes No.....

If yes, how long have you been suffering from forearm pain?

Years..... Months..... Weeks.....

And which side is affected?

Right Left Both

4. Where you feel more pain relatively?

1. Neck pain is more than arm\forearm pain
2. Arm\forearm pain is more than neck pain
3. Neck pain and Arm\forearm pain are equal

5. Do you feel weakness in arm\forearm?

Yes No.....

And which side is affected?

Right Left Both

6. Do you feel numbness in arm\forearm?

Yes No.....

And which side is affected?

Right Left Both

7. How you feel pain in following activity?

	Worse	Better	Unchanged
1) Supine Lying	1	2	3
2) Side Lying	1	2	3
3) Neck Rotation	1	2	3
4) Neck Flexion	1	2	3
5) In sitting	1	2	3
6) Raising from sitting\lying	1	2	3
7) Sneezing\Coughing	1	2	3

8. What do you think about the cause of your pain?

- | | |
|---|--|
| <input type="checkbox"/> Due to injury | <input type="checkbox"/> Due to lifting heavy weight |
| <input type="checkbox"/> Due to bad posture | <input type="checkbox"/> others |

9. When you feel worse pain?

- At morning
- At evening
- As the day progresses
- All day

10. What treatment options you have tried before?

- Rest
- Pain Killer
- Cervical collar
- Massage
- Injection
- Surgery
- Others

11. Is the problem

Improving..... Worsening..... Staying the same.....

Pain Rating Scale

McCaffery & Beebe (1999) suggested Numeric Pain Rating Scale.

For example:

If your Neck pain is between 7 and 9 then circle like below:

0 1 2 3 4 5 6 7 8 9 10

Here Zero (0) means No pain (1-3) means Mild Pain (4-6) means Moderate Pain and (7-10) means Severe Pain.

1. How severe is your Neck Pain today?

0 1 2 3 4 5 6 7 8 9 10

Here Zero (0) means No pain (1-3) means Mild Pain (4-6) means Moderate Pain and (7-10) means Severe Pain.

2. How severe is your Arm Pain today?

0 1 2 3 4 5 6 7 8 9 10

Here Zero (0) means No pain (1-3) means Mild Pain (4-6) means Moderate Pain and (7-10) means Severe Pain.

3. How severe is your Forearm Pain today?

0 1 2 3 4 5 6 7 8 9 10

Here Zero (0) means No pain (1-3) means Mild Pain (4-6) means Moderate Pain and (7-10) means Severe Pain.

Neck Disability Index

This questionnaire has been designed to give us information as to how your neck pain has affected your ability to manage in everyday life.

Please answer every section and **mark in each section only the one box that applies to you.**

We realise you may consider that two or more statements in any one section relate to you, but please just mark the box that most closely describes your problem.

Section 1: Pain Intensity

- I have no pain at the moment
- The pain is very mild at the moment
- The pain is moderate at the moment
- The pain is fairly severe at the moment
- The pain is very severe at the moment
- The pain is the worst imaginable at the moment

Section 2: Personal Care (Washing, Dressing, etc.)

- I can look after myself normally without causing extra pain
- I can look after myself normally but it causes extra pain
- It is painful to look after myself and I am slow and careful
- I need some help but can manage most of my personal care
- I need help every day in most aspects of self-care
- I do not get dressed, I wash with difficulty and stay in bed

Section 3: Lifting

- I can lift heavy weights without extra pain
- I can lift heavy weights but it gives extra pain
- Pain prevents me lifting heavy weights off the floor, but I can manage if they are conveniently placed, for example on a table
- Pain prevents me from lifting heavy weights but I can manage light to medium weights if they are conveniently positioned
- I can only lift very light weights
- I cannot lift or carry anything

Section 4: Reading

- I can read as much as I want to with no pain in my neck
- I can read as much as I want to with slight pain in my neck
- I can read as much as I want with moderate pain in my neck
- I can't read as much as I want because of moderate pain in my neck
- I can hardly read at all because of severe pain in my neck
- I cannot read at all

Section 5: Headaches

- I have no headaches at all
- I have slight headaches, which come infrequently
- I have moderate headaches, which come infrequently

- I have moderate headaches, which come frequently
- I have severe headaches, which come frequently
- I have headaches almost all the time

Section 6: Concentration

- I can concentrate fully when I want to with no difficulty
- I can concentrate fully when I want to with slight difficulty
- I have a fair degree of difficulty in concentrating when I want to
- I have a lot of difficulty in concentrating when I want to
- I have a great deal of difficulty in concentrating when I want to
- I cannot concentrate at all

Section 7: Work

- I can do as much work as I want to
- I can only do my usual work, but no more
- I can do most of my usual work, but no more
- I cannot do my usual work
- I can hardly do any work at all
- I can't do any work at all

Section 8: Driving

- I can drive my car without any neck pain
- I can drive my car as long as I want with slight pain in my neck
- I can drive my car as long as I want with moderate pain in my neck
- I can't drive my car as long as I want because of moderate pain in my neck
- I can hardly drive at all because of severe pain in my neck
- I can't drive my car at all

Section 9: Sleeping

- I have no trouble sleeping
- My sleep is slightly disturbed (less than 1 hr sleepless)
- My sleep is mildly disturbed (1-2 hrs sleepless)
- My sleep is moderately disturbed (2-3 hrs sleepless)
- My sleep is greatly disturbed (3-5 hrs sleepless)
- My sleep is completely disturbed (5-7 hrs sleepless)

Section 10: Recreation

- I am able to engage in all my recreation activities with no neck pain at all
- I am able to engage in all my recreation activities, with some pain in my neck
- I am able to engage in most, but not all of my usual recreation activities because of pain in my neck
- I am able to engage in a few of my usual recreation activities because of pain in my neck
- I can hardly do any recreation activities because of pain in my neck
- I can't do any recreation activities at all

Score: /50 **Transform to percentage score x 100 = % points**

Scoring:

For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked it = 5.

If all ten sections are completed the score is calculated as follows:

Example:

16 (total scored)

50 (total possible score) x 100 = 32%

If one section is missed or not applicable the score is calculated: 16 (total scored)

45 (total possible score) x 100 = 35.5%

Minimum Detectable Change (90% confidence): 5 points or 10 %points

NDI developed by: Vernon, H. & Mior, S. (1991). The Neck Disability Index: A study of reliability and validity. *Journal of Manipulative and Physiological Therapeutics*. 14, 409-415

Statistical Analysis

Analysis of Neck Pain Reduction

Subject	X_1	X_1^2	Subject	X_2	X_2^2
C1	3	9	E1	1	1
C2	4	16	E2	3	9
C3	2	4	E3	3	9
C4	3	9	E4	3	9
C5	3	9	E5	2	4
C6	2	4	E6	0	0
C7	3	9	E7	1	1
	$\sum X_1 = 20$	$\sum X_1^2 = 60$		$\sum X_2 = 13$	$\sum X_2^2 = 33$

$$(\sum X_1)^2 = 400$$

$$(\sum X_2)^2 = 169$$

$$n_1 = 7$$

$$n_2 = 7$$

$$\bar{x}_1 = \frac{20}{7} = 2.857$$

$$\bar{x}_2 = \frac{13}{7} = 1.857$$

Calculating the degree of freedom from the formula:

$$df = (n_1 - 1) + (n_2 - 1) = (7 - 1) + (7 - 1) = 12$$

Now according to t formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\left(\sum X_1^2 - \frac{(\sum X_1)^2}{n_1}\right) + \left(\sum X_2^2 - \frac{(\sum X_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$t = \frac{2.857 - 1.857}{\sqrt{\frac{\left(60 - \frac{400}{7}\right) + \left(33 - \frac{169}{7}\right)}{12}} \times \sqrt{\left(\frac{1}{7} + \frac{1}{7}\right)}}$$

$$t = \frac{1}{\sqrt{\frac{2.857 + 8.857}{12}} \times \sqrt{0.286}}$$

$$t = \frac{1}{\sqrt{0.976} \times 0.535}$$

$$t = \frac{1}{0.988 \times 0.535}$$

$$t = \frac{1}{0.529}$$

$$t = 1.890$$

Analysis of Arm Pain Reduction

Subject	X_1	X_1^2	Subject	X_2	X_2^2
C1	2	4	E1	0	0
C2	3	9	E2	3	9
C3	4	16	E3	4	16
C4	3	9	E4	3	9
C5	5	25	E5	1	1
C6	4	16	E6	2	4
C7	3	9	E7	1	1
	$\sum X_1 = 24$	$\sum X_1^2 = 88$		$\sum X_2 = 14$	$\sum X_2^2 = 40$

$$(\sum X_1)^2 = 576$$

$$(\sum X_2)^2 = 196$$

$$n_1 = 7$$

$$n_2 = 6$$

$$\bar{x}_1 = \frac{24}{7} = 3.428$$

$$\bar{x}_2 = \frac{14}{6} = 2.333$$

Calculating the degree of freedom from the formula:

$$df = (n_1 - 1) + (n_2 - 1) = (7 - 1) + (6 - 1) = 11$$

Now according to t formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\left(\sum X_1^2 - \frac{(\sum X_1)^2}{n_1}\right) + \left(\sum X_2^2 - \frac{(\sum X_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$t = \frac{3.428 - 2.333}{\sqrt{\frac{\left(88 - \frac{576}{7}\right) + \left(40 - \frac{196}{6}\right)}{11}} \times \sqrt{\left(\frac{1}{7} + \frac{1}{6}\right)}}$$

$$t = \frac{1.095}{\sqrt{\frac{5.714 + 7.333}{11}} \times \sqrt{0.309}}$$

$$t = \frac{1.095}{\sqrt{1.186} \times 0.555}$$

$$t = \frac{1.095}{1.089 \times 0.555}$$

$$t = \frac{1.095}{0.604}$$

$$t = 1.812$$

Analysis of Forearm Pain Reduction

Subject	x_1	X_1^2	Subject	x_2	X_2^2
C1	-	-	E1	1	1
C2	4	16	E2	-	-
C3	3	9	E3	2	4
C4	-	-	E4	1	1
C5	-	-	E5	-	-
C6	-	-	E6	-	-
C7	2	4	E7	-	-
	$\sum \bar{x}_1 = 9$	$\sum X_1^2 = 29$		$\sum \bar{x}_2 = 4$	$\sum X_2^2 = 6$

$$(\sum x_1)^2 = 81$$

$$(\sum x_2)^2 = 16$$

$$n_1 = 3$$

$$n_2 = 3$$

$$\bar{x}_1 = \frac{9}{3} = 3$$

$$\bar{x}_2 = \frac{4}{3} = 1.333$$

Calculating the degree of freedom from the formula:

$$df = (n_1 - 1) + (n_2 - 1) = (3 - 1) + (3 - 1) = 4$$

Now according to t formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\left(\sum X_1^2 - \frac{(\sum X_1)^2}{n_1}\right) + \left(\sum X_2^2 - \frac{(\sum X_2)^2}{n_2}\right)}{(n_1 - 1) + (n_2 - 1)}} \times \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$t = \frac{3 - 1.333}{\sqrt{\frac{\left(29 - \frac{81}{3}\right) + \left(6 - \frac{16}{3}\right)}{4}} \times \sqrt{\left(\frac{1}{3} + \frac{1}{3}\right)}}$$

$$t = \frac{1.667}{\sqrt{\frac{2 + 0.666}{4}} \times \sqrt{0.666}}$$

$$t = \frac{1.667}{\sqrt{0.666} \times 0.816}$$

$$t = \frac{1.667}{0.816 \times 0.816}$$

$$t = \frac{1.667}{0.666}$$

$$t = 2.503$$

The interpretation of these values are presented in the Table No. 5 in Result Chapter (Page – 34).

Statistical Probability Table

't' distribution

Directional p	0.4	0.25	0.1	0.05	0.025	0.01	0.005	0.001
Non-directional p	0.8	0.5	0.2	0.1	0.05	0.02	0.01	0.002
Degrees of freedom								
1	0.325	1.000	3.078	6.314	12.706	31.821	63.657	318.31
2	.289	0.816	1.886	2.920	4.303	6.965	9.925	22.326
3	.277	.765	1.638	2.353	3.182	4.541	5.841	10.213
4	.271	.741	1.533	2.132	2.776	3.747	4.604	7.173
5	0.267	0.727	1.476	2.015	2.571	3.365	4.032	5.893
6	.265	.718	1.440	1.943	2.447	3.143	3.707	5.208
7	.263	.711	1.415	1.895	2.365	2.998	3.499	4.785
8	.262	.706	1.397	1.860	2.306	2.896	3.355	4.501
9	.261	.703	1.383	1.833	2.262	2.821	3.250	4.297
10	0.260	0.700	1.372	1.812	2.228	2.764	3.169	4.144
11	.260	.697	1.363	1.796	2.201	2.718	3.106	4.025
12	.259	.695	1.356	1.782	2.179	2.681	3.055	3.930
13	.259	.694	1.350	1.771	2.160	2.650	3.012	3.852
14	.258	.692	1.345	1.761	2.145	2.624	2.977	3.787
15	0.258	0.691	1.341	1.753	2.131	2.602	2.947	3.733
16	.258	.690	1.337	1.746	2.120	2.583	2.921	3.686
17	.257	.689	1.333	1.740	2.110	2.567	2.898	3.646
18	.257	.688	1.330	1.734	2.101	2.552	2.878	3.610
19	.257	.688	1.328	1.729	2.093	2.539	2.861	3.579
20	0.257	0.687	1.325	1.725	2.086	2.528	2.845	3.552
21	.257	.686	1.323	1.721	2.080	2.518	2.831	3.527
22	.256	.686	1.321	1.717	2.074	2.508	2.819	3.505
23	.256	.685	1.319	1.714	2.069	2.500	2.807	3.485
24	.256	.685	1.318	1.711	2.064	2.492	2.797	3.467
25	0.256	0.684	1.316	1.708	2.060	2.485	2.787	3.450
26	.256	.684	1.315	1.706	2.056	2.479	2.779	3.435
27	.256	.684	1.314	1.703	2.052	2.473	2.771	3.421
28	.256	.683	1.313	1.701	2.048	2.467	2.763	3.408
29	.256	.683	1.311	1.699	2.045	2.462	2.756	3.396
30	0.256	0.683	1.310	1.697	2.042	2.457	2.750	3.385
40	.255	.681	1.303	1.684	2.021	2.423	2.704	3.307
60	.254	.679	1.296	1.671	2.000	2.390	2.660	3.232
120	.254	.677	1.289	1.658	1.980	2.358	2.617	3.160
∞	.253	.674	1.282	1.645	1.960	2.326	2.576	3.090

March 15, 2015

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

CRP-Chapain, Savar, Dhaka-1343

Through: Head, Department of Physiotherapy, BHPI.

Subject: Seeking permission for data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Rafiul Karim, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). As per approval of ethical committee of BHPI, I have been conducting a research project title on "Effectiveness of Neural Mobilisation along with McKenzie Approach (Directional Preference) for Cervical Derangement Syndrome" under the supervision of Mohammad Anwar Hossain, Associate Professor and Head, Department of Physiotherapy, CRP. However, conducting this research project is a part of the requirement for the degree of B.Sc. in Physiotherapy. In order to accomplish this study, I want to collect necessary data from the patients attending at out-patient department of musculoskeletal unit, CRP, Savar. Therefore I need to obtain your kind written permission to initiate data collection from the targeted patients. I would like to assure that ethical principles would be followed as per guidelines of my institute/department.

I, therefore, pray and hope that you would be kind enough to grant my application and permit me to collect required data to accomplish my research objectives.

Sincerely yours,

Rafiul Karim
.....16.03.2015

Rafiul Karim

4th Professional B.Sc. in Physiotherapy

Roll – 07, Session: 2009-2010

Bangladesh Health Professions Institute

(An academic Institution of CRP)

CRP - Chapain, Savar, Dhaka- 1343

Forwarded for Approval
16/03/15
Approved
AIG contact with Mizalwaq
C.R.T.
16/03/15
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